Vol. V March 1910 No. 1

Stout Institute

Bulletin

Catalog Number
1910--1911

Published Quarterly
at
Menomonie, Wisconsin

Entered as second-class matter November 20, 1908, at the post office at Menomonie, Wis., under the act of July 16, 1894

Vol. V March 1910 No. I

STOUT INSTITUTE BULLETIN

CATALOG NUMBER

ANNOUNCEMENT FOR 1910-1911

TRAINING SCHOOL FOR TEACHERS OF MANUAL TRAINING
TRAINING SCHOOL FOR TEACHERS OF DOMESTIC ECONOMY
TRADE SCHOOLS FOR PLUMBERS AND BRICKLAYERS
THE HOMEMAKERS' SCHOOL

PRACTICAL APPLICATIONS OF
THE SCHOOL ARTS

PUBLISHED QUARTERLY BY STOUT INSTITUTE
AT MENOMONIE, WISCONSIN

STOUT INSTITUTE BULLETIN

This Bulletin is issued four times during the year:—March-June-September-December.

It covers the application of the principles of technical and household arts and sciences to public school conditions and indicates how these subjects are being developed in Menomonie.

The subscription price is fifty cents per year. Sample copies will be sent upon request.

CALENDAR FOR 1910-1911

1910

June 10—Seventh Regular Session ends.
August 1—Fifth Summer Session begins.
September 2—Summer Session ends.
September 12—Eighth Regular Session begins.

1911

January 27—First Semester ends.
January 30—Second Semester begins.
June 9—Eighth Regular Session ends.

December 17, 1910-January 1, 1911—Holiday vacation.
March 25, 1911-April 2, 1911—Spring vacation.

ANNOUNCEMENT

FOR THE

EIGHTH ANNUAL SESSION

OF

STOUT INSTITUTE

AT

MENOMONIE, WISCONSIN

1910-1911

MANUAL TRAINING, DOMESTIC SCIENCE, DOMESTIC ART, HOMEMAKING, DRAWING, PHYSICAL TRAINING, PLUMBING, AND BRICKLAYING

STOUT INSTITUTE announces the third year of its work as a separate organization, which is the eighth year of the training schools for special teachers. Until 1908 the work was carried on under the direction of the Menomonie board of education in connection with the public school system. At that time the training schools for manual training and domestic science teachers, the trade schools for plumbers and bricklayers, the homemakers school, and the school of physical culture were reorganized and incorporated as Stout Institute.

Cordial relations exist between Stout Institute and Menomonie public schools, the Institute furnishing all of the instruction in mechanical drawing, shop work, domestic science and domestic art, gymnastics and athletics. Students in the training schools are given an unusual opportunity for observation and practice teaching in both elementary and secondary classes.

Each of the training schools for special teachers offers a two years' course covering the theory and practice of handling the work in public schools. The school for homemakers offers a two years' course in the management of the affairs of the home. The trade schools offer one year of practical shop work, including mechanical drawing and arithmetic, covering the essentials of the trade. The school of physical culture provides facilities for all the schools of Menomonie.

OFFICERS OF ADMINISTRATION

L. D. Harvey, President of Stout Institute, Vice President of Board of Trustees

J. H. Stout, President of Board of Trustees

W. H. Hatton, Member of Board of Trustees

Geo. R. Peck, Member of Board of Trustees

W. C. Ribenack, Secretary of Board of Trustees and Treasurer of Stout Institute

George Fred. Buxton, Director of Manual Training School

Grace Fisher, Director of Domestic Economy Training School

H. W. Jimerson, Director of Plumbing Trade School

W. H. Hefelfinger, Director of Bricklaying Trade School

Mrs. Josephine W. Hobbs, Director of Homemakers School

Emma Conley, Preceptress Bertha Tainter Hall and Annex

Mrs. E. C. Gallup, Matron Bertha Tainter Hall

Francesca L. Otto, Registrar

Adalin M. Wright, Secretary

Katherine A. Hahn, Librarian

FACULTY

L. D. Harvey, Psychology and Pedagogy

Milton College, 1872. High school principal, 1873-1879; city superintendent 1880-1885; normal schools, 1885-1898; state superintendent, 1889-1902; superintendent Stout Training Schools, 1903-1908; president Stout Institute, 1908-

George Fred. Buxton, Organization and Literature of Manual Training, Drawing and Design

Pratt Institute, 1899; Teachers College, Columbia University, 1904; University of Wisconsin, summer 1908. Teacher of manual training, Newark, New Jersey, 1899-1901; Portland, Maine, 1901-1903; Springfield, Massachusetts, 1904-1905; Ohio State University, summer 1909; director manual training department, Stout Training Schools, 1905-1908; Stout Institute, 1908-

Leo Ammann, Machine Shop Practice

St. Louis Manual Training School, 1893; Cornell University, mechanical engineering, 1897; Federal Polytechnikum, Zurich, Switzerland, post-graduate work, 1898. Teacher in St. Louis Manual Training School, 1901-1905; Stout Training Schools, 1905-1908; Stout Institute, 1908-

George M. Brace, Joinery, Wood Turning, Cabinet Making, Courses of Study

Beloit College, 1891; M. A., 1895. Teacher in high school, Bay City, Michigan, 1892-1895; teacher in high school, Chicago, Illinois, 1895-1900; director of Manual training, Janesville, Wisconsin, 1900-1903; Marquette, Michigan, 1903-1905; Duluth, Minnesota, 1905-1908; Stout Institute, 1908-

Wm. T. Elzinga, Pattern Making, Foundry Practice, Forging

Apprenticed instrument maker, Amsterdam, Holland, 1887-1891, student Mechanics Institute, New York City, 1902-1903; machinist and erector, metal pattern maker and tool maker with several prominent manufacturers, 1892-1903; instructor forge and foundry practice, Pennsylvania State College, 1903-1904; instructor forge and foundry practice, Colorado State College, 1904-1908; Stout Institute, 1908-

Fred L. Curran, Elementary Woodwork, Primary Handwork, History of Manual Training

State Normal School, Stevens Point, Wis., 1905; Stout Institute, 1908; Bradley Polytechnic Institute, summers 1908, 1909. Teacher in public schools, 1898-1903; principal state graded school, 1905-1907; Stout Institute, 1908-

George G. Price, Mechanical Drawing, Literature of Manual Training

State Normal School, Oshkosh, Wis., 1903; post graduate, 1904; Stout Institute, 1909; University of Chicago, summer, 1903; Bradley Institute, summer, 1908; University of Wisconsin, summer, 1909. Principal of ward school, Iron Mountain, Mich., 1904-1907; director manual training, Fond du Lac, Wis., 1908-1909; principal and teacher of manual training, Lincoln school, Wausau, Wis., 1909-1910; Stout Institute, 1910-

H. W. Jimerson, Plumbing and Gas Fitting

Journeyman and Contractor, 1884-1904; director Minneapolis School of Plumbing, 1904-1908; director Plumbing Trade School, Stout Institute, 1908-

W. H. Hefelfinger, Bricklaying, Cement Work.

Williamson School of Mechanical Trades, 1905. Journeyman and contractor, 1905-1908; director Bricklaying Trade School, Stout Institute, 1908-

O. C. Mauthe, Physical Training

Normal School of North American Gymnastic Union, Milwaukee, 1895; Harvard University summer school of physical training, 1897; Chautauqua, N. Y., summer school, 1899; Gilbert Normal School of aesthetics and social dancing, Boston, summer, 1904. Physical director, Turnverein Vorwaerts, Milwaukee, 1895-1896; West Minneapolis Turnverein, Minneapolis, 1896-1899; special instructor, Harvard University, summers, 1898, 1902, 1903; physical director, Dayton Turngemeinde, and Young Women's League, Dayton, O., 1899-1903; physical director, Shreveport Athletic Association, Shreveport, La., 1903-1909; supervisor of games, Dayton vacation schools, 1904; supervisor of playgrounds, Shreveport, La., 1905-1909; physical director, Stout Institute, 1909-

Grace Fisher, Organization of Domestic Science, Household Management, Dietetics

Utah Agricultural College, 1904; Teachers College, Columbia University, 1908. Instructor in history and English, preparatory department, Utah Agricultural College, 1904-1905; instructor in domestic science, Utah Agricultural College, 1905-1907; supervisor of domestic science, Throop Institute, 1908-1909; director of domestic economy department, Stout Institute, 1909-

Emma Conley, Food Study, Cooking

University of West Virginia, 1900. Teacher Fond du Lac, 1890-1892; principal, 1892-1898; teacher of domestic economy, Fond du Lac high school, 1900-1902; Marathon County School of Agriculture and Domestic Economy, 1902-1909; Stout Institute, 1909-

Wilhelmina H. Spohr, Advanced and Demonstration Cooking, Food Study, Physiology and Hygiene, Home Nursing

Kansas State College, 1897; Stout Institute, 1907. Teacher public schools, Manhattan, Kansas, 1897-1906; Calumet, Michigan, 1907-1908; Stout Institute, 1908-

Daisy A. Kugel, Physiology and Hygiene, Cooking, Home Nursing

University of Michigan, 1900; Teachers College, Columbia University, 1908. Teacher in public schools, 1902-1906; Stout Institute, 1909-

Zella I. Perkins, Chemistry, Biology.

University of Idaho, 1903; University of Chicago, M. S. 1906. Assistant in pure food department, University of Idaho, 1903-1904; teacher of science in Colfax high school, Washington, 1904-1905; Stout Training Schools, 1906-1908; Stout Institute, 1908-

Jessie F. Cross, Inorganic Chemistry, Food Chemistry

Ohio University, 1906; Ohio State University, 1909. Instructor in chemistry, Stout Institute, 1909-

Mabel H. Leedom, Chemistry, Biology

City Normal School, Dayton, Ohio, 1894; Stout Institute, 1910. Teacher in public schools, Dayton, O., 1895-1905; Stout Institute, 1910-

Lurene Seymour, Dressmaking, Textiles, Millinery, Art Needlework

University of Michigan, 1895; New York University, 1905; Teachers College, Columbia University, 1907. Teacher, Lake Linden, Michigan, high school, 1895-1898; Decatur, Illinois, high school. 1898-1906; Stout Training Schools, 1907-1908; Stout Institute, 1908-

Adele M. Jones, Model Sewing, Art Needlework, Millinery, Dressmaking

City Normal School, Dayton, Ohio, 1904; Teachers College, Columbia University, 1908. Teacher Dayton public schools, 1904-1906; Stout Institute, 1908-

Anna McMillan, Model Sewing, Plain Sewing, Primary Handwork

Stevens Point Normal, 1899; Stout Training Schools, 1908. Grade teacher, 1899-1905; teacher of domestic science, Stevens Point Normal School and Grand Rapids Wis., public schools, 1908; Stout Institute, 1909-

Josephine W. Hobbs, Cooking, Model and Plain Sewing

Cook County, Ill., normal school, summers, 1894-1897; Boston School of Domestic Science, 1907. Teacher in public schools, Dubuque, 1898-1906; supervisor domestic science and matron, Moore Street Neighborhood House, Cambridge, Mass., 1907-1908; superintendent, Y. W. C. A. Training School for household service, Boston, 1908-1909; director, Homemakers School, Stout Institute, 1909-

Grace R. Darling, English, Home and Social Economics

University of Michigan, 1884; Teachers College, Columbia University, 1892; Wisconsin Library School, Madison, Wis., 1907. Teacher of history and literature, State normal school, Oshkosh, Wis., 1884-1891, teacher of history and literature, State normal school, Milwaukee, Wis., 1895-1903; Stout Institute, 1908-

Kate Murphy, Interior Decoration and Furnishing, Freehand Drawing

St. Louis School of Fine Arts, 1889; New York School of Technical Design, 1890; New York Studios, 1890-1892; student in European Art Schools, 1908-1909. Director art department, Elmwood Normal School, Farmington, Mo., 1888-9; teacher of drawing in public schools of Chicago, 1893-1894; director art department Menomonie public schools and Stout Training Schools, 1894-1907; Stout Institute, 1908-

Julia A. Bigelow, Physical Training

Normal School of the North American Gymnastic Union, 1906. Stout Training Schools, 1906-1908; Stout Institute, 1908-

THE WORK OF THE INSTITUTE

AT the present time the Institute is carrying on four distinct lines of work. They are:

1. The preparation of manual training teachers and teachers of domestic art and science.
2. The training of young women as homemakers.
3. The training of young men as trade workers.
4. Experimental work in the field of industrial education.

THE TRAINING OF TEACHERS

THE work of each training school for teachers is in character three-fold —academic, technical, and professional. The academic involves the mastery of the subject-matter of the courses, as a matter of knowledge. The technical involves a mastery of the handwork regarded as valuable for training purposes, as a matter of skill. The professional involves a study of educational principles and processes, and practice in applying them in the organization and administration of work in its particular field of educational effort, and a study of the relation of the special work to other phases of the public school curriculum.

While each of these three phases has a content of its own and receives special treatment, the professional phase permeates the entire work in the other two. It appears in the academic work when students are led to observe and consider their own mental processes; to determine the use to be made of the subject-matter in their subsequent work as teachers, and how they are to use it most effectively. It appears in the technical work as it proceeds, when they are led to observe the order of development; to determine whether the particular order followed is essential or not; to note the character and relation of mental and motor activities appropriate and necessary for the proper development of the pupils they are likely to teach.

From beginning to end students are impressed with the idea that they must not only have accurate knowledge of the subjects they are to teach, and skill in the different phases of handwork, but that they must know how to teach others the things they are learning, and to train others to do well the things they are trained in doing.

Students are required to make a careful study of the lines of work they are preparing to teach as they are organized and carried on in the public schools of Menomonie, and of courses of study in the same lines of work in other cities. This study is required in order that students may become acquainted with what is being attempted under varying conditions, what is regarded as most valuable for pupils in different grades in the public schools with the reasons for its value, and its relation to other phases of school work.

The necessary equipment for various lines of manual training, domestic art and domestic science, its cost, and installation are thoroughly studied.

Earnest effort is made to impress students with the fact that though they are to be teachers of special subjects, their work must be related to the other work of the public schools, and that their special work gives them no special privileges as members of the teaching force.

Every student is required to show proficiency in teaching his subject in the regular classes in the public schools of Menomonie before he is grad-

uated. Practically all of the manual training and domestic art and science work in the public schools of the city is taught by student teachers.

GROWTH OF THE TRAINING SCHOOLS

ENROLLMENT BY YEARS

	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9	1909-10
MANUAL TRAINING.....	3	15	20	27	41	46	63
DOMESTIC SCIENCE.....	21	36	38	47	65	124	227

THE TRAINING OF YOUNG WOMEN AS HOMEMAKERS

THE Homemakers School, designed to prepare young women for the responsibilities of home life, was established in 1907. As this is the first school of the kind in the United States, aiming to give a broad training in the practical application of the economic, scientific, ethical, and aesthetic principles underlying the art of homemaking, its organization requires the development of a course of study on new lines, for the realization of a new purpose in the education of girls. This purpose is: To secure a clear conception on the part of the girls being trained, of the character and scope of woman's activities growing out of the proper organization and administration of the affairs of the home; to secure adequate ideas of what constitutes efficiency in the performance of these activities; and through theory and practice under proper conditions, to secure such efficiency.

The problem of what should constitute the body of knowledge used for instructional purposes, and what the particular kinds and extent of practical training in doing, given in the school, was approached in the following manner: An effort was made to determine and formulate the things a woman needs to know and to do in each of certain forms of activity made necessary by her position as homemaker. The forms of activity chosen for consideration were: Those connected with the establishment and maintenance of a suitable shelter for the family; those that concern themselves with the nutrition of the family; those that have to do with the care of the dependent members of the family—children, invalids, and aged persons; and those that have to do with the social, industrial, and ethical relations of the members of the family to each other and to other members of society. The results of this formulation were classified under the following heads: The House, Food Study and Cooking, Clothing and Household Fabrics, Care and Nurture of Children, Home Nursing and Emergencies, and the Social, Industrial, and Ethical Relations of the Woman in the Home and in Society, and, as thus classified, constitutes the course of study.

The character of the work done by the students of the school, their enthusiasm, and the number of persons applying for admission, have fully demonstrated the demand for the kind of training it offers. Lack of room renders it necessary to limit the number of new students who will be admitted to this school during the year 1910-11. It is expected that additional buildings will be ready the following year, and that the limit will then be removed.

A special Bulletin concerning the work in the Homemakers School is issued by the Institute.

THE TRAINING OF YOUNG MEN AS TRADE WORKERS

THIS work was begun in September, 1908, by the organization of a trade school for plumbers and bricklayers. The purpose in this experiment is not alone to furnish opportunities for young men who may wish to learn a trade, but more than this to demonstrate what can be done by pupils in public schools toward the mastery of a trade while they are carrying on the regular academic work of the public school system.

It is evident that trade schools as such cannot be organized in the smaller cities, and if any definite work of value is done in these cities, even in the beginning of instruction for industrial efficiency, it must be done in connection with the public school system.

A special circular of information concerning the work in the trade school is issued by the Institute.

EXPERIMENTAL WORK IN THE FIELD OF INDUSTRIAL EDUCATION

EXPERIMENTS are carried on for the purpose of determining educational values of various industrial processes as exemplified in the handwork now utilized, or which may be utilized in the instructional work in manual training courses; the scope and character of knowledge of industrial processes, conditions, organization and administration adapted to the needs of those being educated for industrial efficiency; the possibilities of industrial education in existing schools together with the necessary modification of existing ideas, courses, equipment, and method, in order to make the industrial phase of education of the highest value.

THE SUMMER SESSION

STOUT Institute Summer Session offers exceptional opportunities for supervisors or special teachers of manual training, domestic art and science, or freehand drawing to advance themselves along their special lines, either in technique or along the professional side. Superintendents and principals are finding these summer sessions an opportunity for learning something of the content and method of school handwork. Grade teachers are perfecting themselves in handling special subjects through summer courses.

Provision is made for outings and games so that a vacation may be combined with a summer course of study. An outing camp is proposed for men attending the summer session if a sufficient number of students express a desire to combine an outing in camp with their work in the school.

Forty-four courses are offered in the summer session of 1910. The session begins August 1, and ends September 2.

GENERAL INFORMATION

LENGTH OF COURSE

COURSES leading to the diploma granted by each of the training schools for teachers require two years' work. No diploma will be issued to any person who has not been a student in residence for at least one year. Upon the completion of one of these courses,—Manual Training or Domestic Economy,—a diploma is issued, which by statute, is made the basis for the issuance of a life certificate, after one year's successful teaching in Wisconsin.

This certifrcate legally qualifies the holder to teach the subjects in which training has been taken, in the public schools of the state. The certificate is issued by the State Board of Examiners and is accepted in most of the other states.

QUALIFICATIONS FOR ADMISSION

GRADUATION from a four years' high school course, or equivalent preparation, will be required for admission to each of the training courses. The candidate must be at least eighteen years of age, and must be possessed of good health and physical energy, of refinement and good character. Testimonials of good character are required.

Students who have had Normal School or Collegiate training will be given credit for such work in the courses they pursue as they have satisfactorily mastered. Successful experience in teaching before entering the Training School, in most cases, reduces the amount of practice teaching required of the student.

GRADUATE COURSES

IN each of the schools a graduate course of one year is offered. These courses are planned to meet the needs of teachers who have had definite training, but who wish to take more advanced work, both technical and professional, than is offered in the regular courses. They furnish excellent opportunities for those who desire to prepare themselves to teach manual training, domestic art and science in professional schools, or for supervising such work in city systems of schools.

ADVANCE ENROLLMENT

SCHOOL accommodations limit the number of students who can be enrolled; for this reason persons who wish to enter should make application in advance for an enrollment blank, which should be filled out and forwarded to the school with physician's certificate, and two certificates of good character. Enrollment will be made in the order of application.

THE DEMAND FOR GRADUATES

THE demand for the graduates of the Stout Institute as teachers of manual training and domestic economy is steadily increasing year by year. At the present time they are teaching or doing supervisory work in twenty-six states and in Porto Rico.

The number of schools in which manual training and domestic art and science are being taught is rapidly increasing and the demand for well trained teachers of these subjects is greater than ever before.

The officers of the Institute are glad to recommend teachers to school officials who are seeking competent teachers of manual training and domestic art and science. In making recommendations every effort is made to name candidates who by training, temperament, personality, and experience are adapted to the demands of the position to be filled. The more complete and definite the information furnished as to the kind and amount of work required, and the salary to be paid, the better we are prepared to select the person most likely to give satisfactory service. We prefer to make no recommendation unless we feel confident that we can name a candidate who will succeed.

SCHOOL EXPENSES

TUITION is one hundred dollars per year, one-half payable at the beginning of each semester. A fee of ten dollars per year is charged to cover the cost of materials used by students in the manual training and domestic science departments. Students taking work in any courses not required for graduation, will be charged an additional fee to cover actual cost of material used in such courses.

Board and room can be obtained at prices ranging from four and a half to five and a half dollars per week—in private families.

LABORATORY FEES

IN the science courses minimum fees are charged for laboratory work. The fees for the regular courses are as follows:

General Chemistry - -	$5.00
Food Chemistry and Chemistry of Cleaning -	2.50
Biology - - -	5.00
Physiological Chemistry and Food Adulteration	5.00

A fee of $2.50 is charged for any elective course in chemistry involving a semester of laboratory work.

In addition to the laboratory fee, students are expected to pay for any breakage which may occur.

LIBRARY AND READING ROOM FEES

A FEE of five dollars payable at the opening of the school year will be required of each student.

All necessary text books will be furnished from the loan text book library for the school year without any further charge to students.

The reference library will be supplied with standard reference books needed to supplement the text books in different subjects and with educational and technical periodicals adapted to the needs of the students.

DORMITORIES

BERTHA TAINTER HALL accommodates about thirty young ladies. The Hall is furnished with all modern conveniences, the rooms are electric lighted, and heated both by direct and indirect radiation, thus assuring ample heat and good ventilation. A large reception room, a

music room, and a reading and study room for those who may prefer to study there rather than in their rooms, are provided. The Hall is three blocks from the school grounds, overlooks Lake Menomin, and is in the midst of spacious, well-kept, well-wooded grounds. It is the aim to make this an ideal home for such students as wish to avail themselves of its accommodations. The home is in charge of a woman of experience and culture, and such regulations and supervision will be maintained as will insure proper conditions for health, effective work, and the proper social life of students.

Tainter Annex accommodates fifty young ladies and is situated on the same grounds with Bertha Tainter Hall. It is thoroughly suited to the purposes for which it was planned. It has a large central living room with two balconies and skylight above, making an attractive place for rest and social activities. The rooms are all arranged in suites of study and sleeping room, each suite for two students. A large dining room in Bertha Tainter Hall provides meals for both Halls.

The charge for room for the school year for each student, is sixty to eighty dollars according to size and location of room. In most cases the lower rate prevails. Board is furnished to all students rooming in the Halls at three dollars and fifty cents per week. Laundry work for all students living in the Halls will be done in the Institute laundry. Rates are reasonable.

HOMEMAKERS DORMITORIES

TWO cottages furnishing home accommodations for twenty students are provided for the students taking the Homemakers course. The cost for room and board is the same as in the Halls.

SCHOOL YEAR

THE school year is thirty-six weeks in length, beginning September 12, 1910, and ending June 9, 1911. Students should arrange to enter at the beginning of the school year if possible. When this is not possible students may enter at the beginning of the second semester.

The summer session is five weeks in length, beginning August 1, 1910, and ending September 2, 1910.

Address all correspondence regarding courses of study or general work of the Institute to

L. D. HARVEY,
President Stout Institute,
Menomonie, Wisconsin.

MANUAL TRAINING SCHEDULE

JUNIOR YEAR

SEMESTER SUBJECT IS GIVEN		NUMBER PERIODS PER WEEK	NUMBER OF WEEKS	TOTAL NUMBER WEEKS
1 & 2	Psychology and Pedagogy	5	18	90
1	History of Manual Training	4	9	36
2	Materials of Construction	4	9	36
2	Literature of Manual Training	4	9	36
2	English	5	12	60
1 & 2	Class Talks	2	36	72
1	Mechanical Drawing	6	18	108
1	Design	4	9	36
1 & 2	Elementary Woodwork	10	18	180
1	Joinery	5	18	90
2	Wood Turning	2	18	36
1 & 2	Forging	10	18	180
2	Tinsmithing and Repair Work	4	9	36
1	Clay Work	4	9	36
2	Paper and Cardboard Work	4	9	36
1	Weaving, Basketry, and Bent Iron Work	4	9	36
1 & 2	Physical Training	4	36	144

SENIOR YEAR

1	Organization of Manual Training	4	9	36
1	Courses of Study	4	9	36
2	Literature of Manual Training	4	9	36
2	Equipment	4	9	36
1 & 2	Class Talks	2	36	72
1	Freehand Drawing and Design	10	9	90
1 & 2	Mechanical Drawing	10	27	270
1 & 2	Pattern Making and Foundry Practice, or 1 & 2 Plumbing and Bricklaying	8	36	288
1 & 2	Cabinet Making, or 1 & 2 Machine Shop Practice	12	36	432
1 & 2	Observation and Practice Teaching	6	36	216
1 & 2	Physical Training	4	36	144

GRADUATE COURSES

REQUIRED WORK

Manual Training Theory, Decorative and Structural Design, Graduate Drafting, Practice Teaching.

SPECIAL STUDY

One or more of the following: Psychological and Pedagogical Aspects of Manual Training, Correlations between Drawing and Construction, Architectural and Machine Drafting, Furniture Design, Advanced Woodwork, Advanced Metalwork.

OUTLINES OF COURSES
FOR MANUAL TRAINING TEACHERS

IN order to indicate the aims and scope of work offered for teachers of manual training the following outlines are here presented covering the Handwork for Primary, Intermediate, and Grammar Grades, Woodwork and Metalwork for Secondary Schools, Plumbing and Bricklaying, Drawing and Design, and Professional Work:

HANDWORK FOR PRIMARY GRADES

PAPER AND CARDBOARD. As a preparation for supervisors of elementary manual training the place of first importance is given to construction in paper and cardboard. Objects are made which seem to bring in the most typical processes of using these materials, and directions are given for the handling of this work in public schools.

Free cutting is given for training in observation and imagination and to bring in the first use of scissors and paste. Thin cover paper is cut and pasted upon a heavier paper.

Card mounts and other single piece problems of heavy material are introduced for the study of proportion and for drill in cutting to line.

The making of booklets begins with the folding of single pieces of paper, then follows the making of folder with cover, and tied booklet with cover, the sewed and the glued booklet.

Bookbinding is given for third and fourth grades and includes the making of portfolio, the repairing of books and the full process of binding a small book.

Envelopes, paper sacks, and filing devices are made, first by folding and cutting, later by measuring and cutting, and finally by laying out to measure.

Boxes are made from heavy tag board and pulpboard, introducing first the folding of lap joints and gluing corners, then the making of boxes with cloth reinforced corners and paper lining. Boxes with fitted covers are made at the close of the course.

CLAY MODELING AND POTTERY. The modeling of type forms and their application to common objects is given as a preparation for modeling from objects, from pose, from photographs, and from memory images. Relief ornament is designed and modeled and panels made for casting in plaster. The main feature of the course is the making of pottery, which is the only strictly manual training work in clay.

Pottery is given for classes in the first four grades and consists principally in the making of small hand built pieces of ware involving different kinds of manipulation. Relief and incised decoration are carried out in the making of vase forms. Wheel throwing is illustrated and a few pieces thrown by the class. Moulds are made and vases cast to illustrate an important commercial process. A study is made of clays and of glaze materials, matt and bright glazes are mixed, and each student glazes and fires a part of his work,

WEAVING AND BASKETRY. Paper strips are woven to illustrate the making of patterns, and a rug is woven for each of the first four grades, using cotton and woolen yarns and chenille, and working on small wooden looms. Basketry for primary grades consists in making a coiled mat, coiled basket, and rattan baskets of different shapes.

THIN WOOD CONSTRUCTION. Problems in selecting, assembling, and fastening with glue and brads, strips of thin wood to form miniature pieces of furniture, boxes, bird houses, and other small articles are given, with methods of class presentation and ways of preparing materials for class work. Combinations of cardboard and wood are suggested for a few types of construction.

HANDWORK FOR INTERMEDIATE AND GRAMMAR GRADES

WOODWORK FOR FOURTH AND FIFTH GRADES. Work for the grades below the sixth is planned to prepare the student for the conditions under which the work is usually taught. The only tools used are the block plane, hack saw, coping saw, chisel, bit, knife, carving punch, file, try square, rule, and pencil. The principles are taught and the exercises performed in such a manner as to directly lead to the more difficult bench work.

Exercises involving the use of the above tools are presented in such a way as to prepare the student for teaching the simpler wood processes. The models completed in the course are similar to those used in the fourth and fifth grades of the Menomonie public schools, but the pursuance of the course means something more than the production of a series of carefully made models. The prospective teacher in this work should develop habits and powers of observation, scientific thought, mechanical and executive ability, and a reasonable degree of rapidity.

Working drawings are made for a part of the course, and the reading of drawings is made an important feature throughout.

The stock is with few exceptions prepared in thickness before it is given to the student, the dimensions of length and width only being considered. The last few models require a consideration of thickness.

WOODWORK FOR SIXTH, SEVENTH, AND EIGHTH GRADES. Work for the upper grades is planned for a room with a rather full equipment of wood working benches and tools. The serious bench work begins in the sixth grade, each problem introducing one or more new exercises or involving added difficulty, the whole course being arranged in a sequenced order of steps. The handling of woodwork classes in public schools is the central thought of the course.

Exercises are given in sawing and planing to dimensions, and in squaring up stock. The chisel and gouge are brought into a variety of uses in the making of straight and curved models. The brace and bit is used for different kinds of work, the spoke shave and other special tools are used for such constructions as call for them. Different joints and methods of fastening are taught and several pieces are finished with stains and polished. For a part of the course articles are designed, drawn, and constructed by the student.

BENT IRON AND SHEET METAL. The course in bent iron gives pupils of the elementary schools a first acquaintance with the handling of iron as a material of construction, enabling them to learn something of its properties and typical uses. An attempt is made to use the material in both decorative and structural ways, consistent with the nature of the material.

The principal operation consists in bending these strips of soft iron ribbon with the straight or round nose pliers into such shapes as are desired, and fastening two or more

pieces together with small iron binders, which are clamped around the pieces. Riveting is also introduced as a means of fastening the work. The principal decorative piece is the lantern, with top and bottom of taggers sheet iron, suspended by a chain to a small bracket of bent iron work. The bridge truss as a typical structural piece is made and tested, and the student proves the value of the proper disposition of the material used.

TINSMITHING. Twelve weeks in experimental work was given in this subject in the seventh grade of the Menomonie public schools last year and it was considered successful. The course will be continued this year with some modifications. The boys are taught methods of laying out, bending, cutting, riveting, and soldering. The course will be given in the training school this year.

I. Tools used: tinner's snips, stakes, hammer, rivet sets, pliers, soldering coppers, gasoline furnace.

II. Materials used: sheet tin, rivets, solder, acid, rosin.

1. Laying out, cutting to line, and riveting.
2. Bending and riveting,—small box.
3. Soldering straight joint.
4. Patching hole with tin and solder.
5. Riveting square tube.
6. Riveting and soldering cylindrical tube.
7. Laying out, cutting and bending curves, soldering,—funnel.
8. Laying out, cutting, bending, and fitting,—small dust pan with handle.
9. Review previous processes,—box with cover.
10. Riveting and soldering,—making and joining of two square tubes at an angle.

POTTERY. The elementary pottery for primary grades is continued in more advanced work in the making and glazing of decorated pieces for upper grades.

WOODWORKING FOR SECONDARY SCHOOLS

JOINERY is planned for the first year's work in high schools, and is arranged according to difficulty of tool operations. A series of joints important to the carpenter and cabinet maker is made and applications are pointed out. The work in the cabinet making course, which follows this course, brings many of the joints into use in constructions. A part of the joints are sawed to a fit and a part of them are chiseled. Each student in this course is expected to develop an ability to saw a joint accurately and to plane and chisel to fine dimensions and close fits. The course includes:

Planing exercise—squaring up stock to required dimensions. Sawing exercise—making cuts at different angles to the surface of the stock. Chiseling exercise—with the grain and at angles. Butt joints—different types of fastening as used for different classes of work. Lap joints—for different classes of work, spliced joints, mortising exercises, mortise and tenon joints, dovetail joints, house framing exercises, joining edges of boards in different ways, polishing exercises.

CABINET MAKING. Instruction is given in the application of joinery to the making of furniture, tool chests, cabinets of different kinds, and general interior finish by means of bench and mill work and discussions of the problems of the cabinet maker.

A small stand is made as a type,—each student designing, drawing, tracing, blue printing, making mill bill, getting out stock, cutting to size, smoothing surfaces, fitting joints, assembling, staining, and polishing. Pieces of board are treated in several ways

to show different effects of stains and polishes. Cabinet making problems involving accurate tool manipulation, thorough knowledge of woodworking machinery, and ability to use wood finishes make up the balance of the course. Instruction is given in the proper handling of a cabinet maker's equipment of bench tools, in the care and use of the swing saw, circular saw, band saw, jointer and surfacer, and the special tools in the mill equipment at the Institute. Suggestions are given for carrying the work on in schools where woodworking machinery is not available.

WOOD CARVING. Exercises in wood carving are given to develop facility in handling carving tools and to give an acquaintance with cuts involved in grooving, in sinking back grounds and in modeling curved surfaces. Finished pieces are worked out which become parts of constructions. The aim is to train in the application of design to the decoration of wood constructions.

Units of ornament are worked out in soft wood, first in straight and then in curved line designs. Book stall ends are designed and carved in simple curves varied from the Greek anthemion; small desk pieces such as blotting pads, ink stands, and pen trays are worked out in low relief carving or inlaid decoration; as panel for cabinet or box involving considerable surface modeling, a piece is designed, carved, and finished; a table leg, pedestal support, or piece of modeling from life, or photograph or cast, is carved in the round. Kinds of treatment adapted to geometrical designs, conventionalized natural forms and purely naturalistic features are illustrated. As the ability to teach carving depends principally upon the appreciation of good design and ability to use the carving tools, little time is given in this course to class room method and logical sequence, but attention is concentrated upon the development of ability in carving.

WOOD TURNING is given for second year high school classes although it may be introduced into the first year if there is a desire to push the work down from the upper years. The course covers exercises planned to give familiarity with both turners' and pattern makers' work and introduces power machinery. Attention is given to correct position of the body, manner of holding the tools, correct use of tools, methods of sharpening, dangers to avoid.

A series of exercise pieces is made in soft wood, bringing in the turning of cylinders, cones, stepped cylinders, V grooves, circular grooves, beads, and reverse curves, turned between centers. This is followed by face plate and chuck work and a fitting exercise. Hardwood applications of turning exercises include tool handles, mallets, ring, ball, and pieces designed by the student. Work in preparation for pattern making includes the making of several pieces between centers and on the face plate by scraping, and a few simple turned patterns. Students are required to take proper care of lathes and tools, and to observe the application of those principles necessary for the successful teaching of wood turning. Good qualities to look for in a lathe are pointed out.

PATTERN MAKING is taught in connection with Foundry Practice. Patterns are made in the wood shop and molded in the foundry. Castings are finished in the machine shop. The aim of the course in pattern making is to give an acquaintance with tool processes and methods of construction, shop kinks, and considerations necessary to successful molding. The rules for draft and shrinkage, and methods of preventing irregular crystalization of cast metal are explained and applied, and the importance of constantly considering the molding process and the finishing in machine shop is impressed upon students. The method of applying and the reason for using different kinds and colors of varnish are explained. Part of the course is

devoted to the construction of patterns for new apparatus, new tools, and repair jobs around the school to give a touch of that feeling of independence as designer and mechanic in this line of work.

The first part of the course is confined to bench work, beginning with one-part patterns, involving straight cutting, making draft, setting rib with glue and brads, laying out and cutting for green sand core, sand papering and shellacking; then taking up curved cutting, the use of leather fillets, and the making of core prints and core box. Next two-part patterns are introduced, bringing in the use of draw knife, rasp, and file, the gluing up of joints with paper, splitting joint doweling, fitting core prints, making two-part core box for same and using black shellac for core prints and core box.

After the above bench work the course involves lathe work, at first by itself and then in connection with bench work; cylindrical turning is followed by irregular turning and the use of templates, fitting of spokes, building-up and chucking.

GRADUATE WOODWORK. Opportunity is furnished for those taking advanced work who wish to do extra work in cabinet construction, wood carving, wood turning, or pattern making.

METAL WORKING FOR SECONDARY SCHOOLS

FOUNDRY PRACTICE. Patterns finished in the wood shops are taken to the molding room and students are given acquaintance with molding processes and the management of a foundry, core making and the use of cores, the mixing of irons and the handling of a cupola. A part of the molding is done before taking up pattern making, in order that the patterns may be made with a clear understanding of their use and mistakes avoided. The main part of the course follows the pattern making and tests the correctness of the patterns, demonstrating the necessity for carefully considering draft, shrinkage, machining and coring in the making of patterns.

Words and terms peculiar to the work are explained and used. The characteristics of a good molding sand are shown and sand is prepared for use. Different kinds of molding are explained. Simple one-part patterns are molded, followed by patterns involving green sand cores, then two-part patterns, simple core work, balanced cores, and more difficult work molding in two and three-part flasks. Instruction is given in the use of moulder's small tools, the cutting of gates, the running of vents, the setting of cores, and the clamping of flasks; also in the making of core mixtures and the proper use of the core oven; the lining of ladles, repairing, daubing and charging of cupola; the mixing of iron for definite uses, melting, tapping, and pouring into moulds; shaking out the moulds and cleaning castings.

FORGING. Appliances are described and their operation explained before beginning work at the forge. The uses and care of tools and materials used in forge work are considered in class talks. The necessary processes of working iron and steel are taught together with their applications in practical work. The basic operations of forge practice are taught through the making of a number of exercise pieces and finished articles. After each principal exercise opportunity is given for practice upon a problem which involves an application of the exercise.

The sequence of operations follows:

Building fire, cutting cold iron with hardie, heating metal, taking proper position in relation to anvil, holding work with suitable tongs, striking correctly, drawing round bar to square, drawing square bar to round.

Upsetting stock on end, using heading tool, chamfering, swaging with top and bottom swage, cutting thread.

Bending and scarfing, scarf-welding two ends of a ring, and ends of two pieces. Upsetting stock in the middle, bending and making square corner outside and inside, laying out bracket, using center punch and hot punch.

Fullering with top and bottom fuller, splitting with hot cutter, spreading in heading tool, shaping irregular curve, drawing out to point.

Drawing out two parts to fit each other, drilling, riveting, grooving.

Manipulation of tool steel, hardening, tempering and annealing, twisting, pointing, sharpening.

Use of flatter and hot cutter on tool steel, grinding and tempering for cutting different materials.

Forming and hot punching tool steel for cross pene hammer, polishing faces, hardening and tempering face and pene with one heat.

The above exercises are applied to more difficult work in tool smithing or to decorative work involving the designing and executing of such objects as lamps, hanging lanterns, andirons, fire place tools, gates, or grilles.

An important feature of the course is the requirement that each student shall do some practical work in the way of repairing equipment or keeping the tools and appliances of the shop in good condition. The purpose of this is to give a training in shop management that will aid the student in solving problems that will come up in his later work as a shop instructor and manager.

MACHINE SHOP PRACTICE. The gaining of a direct and systematic method of attacking the problems of the machinist is the object of the course in bench and machine tool work. Fundamental operations of the modern machine shop are covered through the making of a number of pieces of work involving the typical use of a number of tools. The course consists largely of exercises which are of no value as finished pieces, but which teach in the quickest possible time the most important processes in machine shop practice.

The general scope of tool processes follows:

Cylindrical turning, taper turning, turning curved shapes, work on speed lathe, thread cutting, and making standard bolts and nuts.

Turning to different kinds of fits, chuck work, face plate work, boring and use of reamer, finishing work on mandrel, square and angular cutting on shaper, cutting key way on shaper, finishing large surfaces on planer, cutting sliding fits on planer, cutting surfaces, angles and T slots on milling machine, gear cutting, brass turning, threading and knurling, drilling on drill press, use of cold saw, grinding on cutter grinder, use of wet tool grinder, chipping, filing and scraping, use of hand taps.

MACHINE SHOP THEORY. Lectures, demonstrations, and discussions of topics related to machine shop practice make up the theoretical side of the course. This course is conducted largely in the machine shop and covers the equipment, processes, and shop mathematics necessary to the successful handling of public school shop classes.

The course covers a study of the following topics:

Tools and supplies—selection and purchase of machine tools, small tools, and general supplies.

Machine equipment, erecting, and installing—study of cost and adaptability of machine tools, location of shafting, setting of machines, selection of belting.

Theory of cutting tools—rake, clearance, setting tool for different classes of work, special shaped tools, chattering.

Cutting feeds and speeds—definitions, method of finding cutting speed.

Taper turning—definitions, setting over of tail, center, use of compound rest, use of taper attachment, taper turning lathe, boring tapers, cutting taper threads, testing tapers.

Thread cutting—definitions and formulas, selecting change gears, grinding and setting threading tool, swiveling compound rest, cutting threads, measuring and testing threads.

Taps and drills—selection of taps and dies, drill sizes for given sizes of taps, clear-

ance of twist drills, holding drill in chuck, grinding drills.

Gear cutting—systems and classes of gears, selection of cutters, centering cutters, indexing, cutting spur, bevel, worm, and spiral gears.

Grinding and grinding machines—advantages of grinding, speeds and feeds, keeping work cool, use of cutter grinders.

Use of formulas—in determining sizes and amounts of cutting in various operations.

HAMMERED METAL WORK. Decorative work is given in copper and brass, problems being worked out so as to bring in typical operations in the handling of sheet metal. Sheet sterling silver of several gauges is on hand for students who wish to inlay or make jewelry or tableware. Attention is directed to the making of good forms, to good workmanship, and to suitable decoration and surface effects. The first part of the course may be carried on by schools with meagre equipment, the more difficult pieces following requiring a number of additional tools and parts of equipment.

The following processes are covered in the course:

Hammering against a block of wood, into a hole, and over a stake.

Surface marking.

Decoration by means of repousse work.

Sawing outlines of pieces, pierced designs.

Engraving simple design.

Riveting joints, corners, hinges, and fastenings.

Soldering with hard and soft solder.

Etching, inlaying, and enameling.

ADVANCED METAL WORK. Graduate students may elect to do advanced work in the machine shop, making and assembling parts of machines, or to do special work in hammered metal and enameling.

PLUMBING AND GAS FITTING. Teachers of manual training are given an acquaintance with some of the plumber's problems in order that a better idea may be had of general industrial conditions and better provisions made to meet these conditions in manual training courses. Those engaged in teaching or directing the teaching of trades in special schools are given an idea of how the trade instruction is carried on in Menomonie. Constant additions are being made to the shops to keep up an equipment of up-to-date tools and fixtures.

The course includes: Cutting of threads in iron pipe. Use of unions, right and left elbows, and couplings. Running of a soil pipe line with vertical and horizontal joints. Making of caulked joints as used by plumbers. Care and use of the plumbers' gasolene furnace. Wiping a typical joint. Use and care of the soldering iron. Making a cup and overcast joint, and running seams. Setting up and installing fixtures.

BRICKLAYING. This course is offered for teachers who may wish to become familiar with this line of work in a trade school, and learn some of the important operations of the bricklayer and stone mason, and see the organization of the work at Stout Institute.

The following matters are considered, and opportunity is given for practice, as far as time allows, along each direction: Bonding of different kinds of walls and of different thicknesses. Building of brick arches, cutting of brick, and fitting. Mixing of lime and cement mortar in different proportions. Building of different types of brick work such as: cornices, pilasters, panels, piers, corners at different angles, stacks, flues, party and retaining walls. Building of scaffolds. Chipping and laying stone. Testing work for strength.

CEMENT WORK. Since cement has come into such general use as a building material, there has come a demand for instruction in the use of it in public schools. A course of this kind can be carried on with very little equipment and inexpensive material, and at the same time, give a practical acquaintance with an important industry.

The course consists of: A series of short talks on the history, composition, manufacture, and use of cement. Practical work in mixing cement, mortar, and concrete. Building of foundations, piers, piles, sidewalks, sewers, and dams. Making of reinforced work of several types, and the construction of forms and molds.

DRAWING AND DESIGN

FREE HAND DRAWING. Practice is given in free hand perspective and the representation of type forms as a preparation for making pencil and blackboard sketches of manual training projects. Attention is given to the development of a good technique, and students are directed to study examples of good drawing.

PRINCIPLES OF DESIGN. Lectures are given on the principles and practices of design, with suggestions for the handling of design in connection with manual training classes in public schools. The aim is to give students a basis for criticism of applied arts products, to develop taste, and to establish a theoretical foundation for practice in design. Blackboard sketches and lantern slides are used to illustrate the talks, which cover the principles of art and their application to design; rules for design; suggestions for appropriateness of design to use, materials, and type of construction; study of outlines, fastening and ornamentation; special considerations necessary for working in paper, textiles, ceremics, wood, and metal.

GENERAL DESIGN is given during the junior year and furnishes practice in illustrating principles of design, and prepares for the applied design of the senior year. The work is done principally in pencil and good execution is required.

A study is made of the rectangle and its subdivision into interesting proportions by vertical and horizontal bands, by borders, and by slanting features.

After each series of sketches a selection is made and used as a basis for lines of emphasis in a finished drawing of a box, or cabinet, or other construction based upon the rectangular prism.

Following this, a study is made of different kind of lines, applications being made to free non-rectangular forms, and also used as parts of decorative ornament.

Natural forms are conventionalized and fitted to different shaped areas.

Units of historic ornament are studied and appropriate applications pointed out.

Types of structure are examined and made the basis of a series of designs of practical problems.

HISTORY OF ART AND DESIGN. Lectures are given on the development of the arts to familiarize students with the historic setting of types of construction and ornamentation that have influenced present designers and interior decorators. Attention is first directed to the development of architecture and decoration and the historic styles in furniture, then the pottery and metal work of various peoples are considered, European tendencies in design are noted, the crafts movement is reviewed, and American tendencies in design are discussed.

APPLIED DESIGN. Typical problems for manual training classes are worked out in different mediums. Thought is directed constantly to the application of principles of design to constructions and to the necessity for considering the adaptability of the construction to public school classes. The course consists partly of a study of methods of construction of typical projects, partly in refinement of proportions, and partly in the application of ornament. Full sequences of models for courses of study in the different materials are planned by senior students for assigned grades.

Problems are worked out in the making of designs for paper boxes and booklets, and other problems in paper and cardboard construction.

Designs are worked out for coiled raffia baskets, rattan baskets, and rugs with simple border designs.

Bent iron designs are made for decorative projects and for illustration of structural use of material.

Jars, inkstands, trays, bowls, and vases are sketched for pottery classes.

Constructions suitable for elementary woodwork are drawn for different grades and with a variety of constructive features.

Furniture design includes chairs, tables, and case-work, suitable for high school classes.

Designs for gavels, pedestal bases, and table legs are made to illustrate necessities for wood turning design.

Decorative forging and hammered metal furnish opportunities for the design of lamps and brackets, stands and grilles.

ELEMENTARY MECHANICAL DRAWING. A course of drawing is given that will enable students to acquire: (a) proficiency in the use of instruments, (b) knowledge of the conventions and methods in drafting room practice, (c) acquaintance with elementary geometrical constructions, (d) an understanding of orthographic projection and development, (e) ability to make working drawings of shop models.

The first drawings are in pencil and are suitable for the seventh and eighth grades, where the instruments used are few and simple and the theory of projection is not explained. This work includes the making of exercise sheets and working drawings.

The remaining drawings are finished in ink and are suitable for high school classes.

Sheets of lines, letters, and figures are given to develop ability in the use of a full set of drawing instruments.

This exercise work is followed by several sheets of geometrical constructions.

The subject of projection is made the principal feature of the course. Students are made familiar with the meaning of planes of projection and their use in making working drawings, kinds of projection, angles of projection, geometrical drawing, and methods of teaching projection to high school classes. Drawings are made of geometrical solids in different positions, and of developments of intersections.

ADVANCED MECHANICAL DRAWING. The aim of this course is to meet the demands upon teachers in those schools which aim to prepare their students for higher technical schools or for drafting room practice and for those giving a general course in mechanical drawing.

The course includes:—(a) advanced work in projection, a study of perspective, and simple work in shadows, (b) sketching machine details and making machine drawings, (c) drawing architectural details, plans, and elevations, (d) working out a course in mechanical drawing.

Lettering and drafting conventions.

Projection at double angles, projection of irregular curves, projection of shadows.

Perspective parallel to picture plane and at angles to picture plane, projection of perspective scheme, perspective of room interior and of cottage exterior, topographical perspective, and perspective of cast shadows.

Development of helix and application to V and square threads, conventional threads, bolts, and nuts.

Heart cam and irregular cams, spur gears, and stand of gears.

Details of machine parts, assembly drawing of machine.

Floor plan of frame building, front and side elevations, construction details, and heating system.

Tracing and blue printing.

GRADUATE MECHANICAL DRAWING. Projection and perspective drawing in their various phases are taken up thoroughly and some of the more difficult geometrical problems are also worked out. Methods of work having the most general application are kept to the front, but alternate methods and checks are continually pointed out. The aim is to develop an ability to handle easily the high school work in drawing, to be able to solve any drafting problem that is likely to arise, and to see the application and value of technical ability acquired.

The following indicates the scope of work:

Intersection of sphere and cone. Intersection of two cones.

Perspective of house with cast shadow. Perspective of cylindrical, conical, and spherical solids.

Cycloids and trochoids. Approximate involutes.

Involute gearing, single curve. Involute gearing, double curve. Bevel gearing.

Detail measured machine drawing. Assembly machine drawing—from details.

Construction details of panel, door, drawer, shelving. House framing details. Stair details.

ARCHITECTURAL AND MACHINE DRAFTING. To students taking graduate work who desire to specialize along the lines of either architectural or machine drafting, an opportunity is given to become acquainted with the general conditions underlying each of these fields. Detail drawing, planning, and assembling each has a place in this course.

Architectural Drafting—The heating, lighting, plumbing and ventilating of a modern dwelling is studied through assigned reading, lectures, and the making of diagrams; a study of the different orders of architecture and lessons in architectural design, architectural principles including room arrangement and conveniences, a comparison and criticism of different house plans with regard to cost, provisions of specifications, etc., and a short review of laws governing building and sanitation preparatory to the making of complete plans, and working details, specifications, and estimates of cost of a modern two story frame dwelling.

The principles of brick, stone, cement and steel construction are taken up and drawings made of types of construction that will involve the use of one or more of these materials.

Machine Drafting—Elements of machine design are taken up and a study made of steam or gasolene engine drawing, electrical machine parts, machine tool construction, etc., in such a way as to enable teachers to carry out shop problems in the making of patterns and machining and assembling of parts for such machines, according to modern shop theory and method.

PROFESSIONAL COURSES

PSYCHOLOGY AND PEDAGOGY. This work is taken at the beginning of the junior year and is limited to a consideration of principles, fundamental in character, and to the application of these principles in the actual work of teaching. Time does not permit the study of psychology as a culture subject. The students who have so studied it, but have not given consideration to the application of its fundamental principles in teaching, will need to take the prescribed course.

Special attention is given to the psychology of attention, habit, and will. Those principles of pedagogy are considered which may be shown to have a practical application in the teacher's work. In the academic, shop, and laboratory work, it is the aim of the teacher not only to have students master the special work under consideration, both from the academic and the technical standpoints, but at the same time to consider the work from the standpoint of the teacher. Practical exercises are given throughout the course requiring a conscious application by students in their work of the psychological and pedagogical principles studied.

OBSERVATION AND PRACTICE TEACHING. During the senior year students are required to systematically observe the work of experienced teachers in conducting classes in their respective lines of work in the public schools. The observation work is under the direction of members of the training school faculty. The observation required is not simply a "looking on;" the teachers in charge direct the attention of the observers to definite aims, methods, and results.

Methods of different teachers in the instruction and control of classes are studied, not to be copied, but to determine how far they are based on sound pedagogic principles. The work under observation is discussed by those observing and the teachers in charge of the observation classes. Weaknesses are pointed out and the reasons for the weakness shown from a pedagogic standpoint. The strong work is noted and the reasons for its strength discussed. The aim is to make students familiar with the application of psychological and pedagogical principles through a careful observation of the various ways in which these principles are applied by different teachers in different phases of the work. After the observation work has been continued for a reasonable time, students are put in charge of classes and are given practice in teaching in different grades. Before beginning practice teaching in any grade, students are required to thoroughly familiarize themselves with the work outlined in the course of study for that and lower grades and by observation of the class, to determine what progress has been made in the course and what are the next steps in order. Before taking charge of the classes, they are required to prepare definite plans indicating the proper order of procedure. The practice teaching is done under the supervision of the special teacher of the particular line of work in which the instruction is given. In the class work of the regular teachers in the training schools, an effort is made to bring into the consciousness of the students the pedagogical principles upon which the work there is based.

ORGANIZATION AND ADMINISTRATION. By means of lectures, discussions, essays, and written reports, the problems of organizing, teaching, and supervising manual training are brought out, and through making outlines, schedules, and tables, the work is systematized for practical use. A brief consideration of educational doctrine is taken as a foundation for a study of specific aims of manual training. The selection of problems, which shall contain proper disciplinary value and at the same time give a fund of usable knowledge is made a feature of the course, and suggestions are given for adapting courses to a given community.

The course covers the following topics:

Educational theory, important for the teacher of manual training.

Scope of manual training for public schools, cultural and practical features, kinds of school work desirable.

Qualifications of the special teacher.

Organizing courses, making schedules of classes, and planning equipment.

Keeping records, making reports, and filing information.

Getting up exhibitions and lectures and arranging printed matter.

Preparation for daily lessons, determining purposes and subject matter, making lesson plans, getting tools and stock ready for use.

Teaching manual training, individual and class instruction, testing and drilling; setting of definite standards, systematizing the handling of classes.

Laying out courses for others to teach, selection of teachers, conducting teachers' meetings, visiting classes, and holding conferences.

Unifying of entire subject matter and relating it to regular school course.

HISTORY OF MANUAL TRAINING. The aims of this course are: (a) To trace the adjustments of the schools to changing social needs, (b) to follow the growth of the manual training movement, (c) to get a broad view of education and of manual training, (d) to establish a

basis for an understanding of the present educational and industrial needs of our country, (e) to study the present social, industrial, and economic conditions in order to determine what forms of industrial education are required.

The following topics are studied:

Early educational history.

Pestalozzi, effect of his work, comparison with other educational reformers.

Education in Germany and France with reference to manual training.

The manual labor movement.

M. Victor della Vos and the Russian system of manual training.

Uno Cygnaeus, Otto Salomon, and the Sloyd movement.

Manual training in England, Denmark, and Switzerland.

General survey of manual training and technical education throughout Europe.

Introduction of manual training into the United States.

Growth of manual training in the United States.

Present conditions of the course of study.

Industrial tendency in education—its cause and its demand upon the manual training schools. Comparison of vocational, trade, and technical schools.

JUNIOR LITERATURE OF MANUAL TRAINING. A thorough study is made of the three following books: Salomon,—The Teacher's Handbook of Sloyd; Woodward,—The Manual Training School; Sickles,—Exercises in Woodworking.

Students are required to analyze and review each of the books. Discussions cover the scope of the reading and an understanding of principles and practice in manual training suggested in the reading.

SENIOR LITERATURE OF MANUAL TRAINING. With the conviction that the student of manual training should become acquainted with its literature, a large number of publications are read and reviewed. The theory of manual training, drawing, shop processes, and methods of teaching are covered during the course.

Oral and written reviews are required of books containing matter pertaining to the industrial aspect of education, books dealing directly with manual training, magazine articles relating to public school handwork, and published reports of associations.

Books reviewed cover the following subjects: General pedagogical matter, the Sloyd system, technical processes, mechanical drawing, design, arts and crafts.

Magazines of education, magazines dealing especially with manual training, art and technical matters, and school publications are reviewed.

Educational reports reviewed include: reports of association meetings, state educational reports, federal department reports, reports of commissions, reports from foreign countries.

PLANNING OF MANUAL TRAINING COURSES. By means of a study of manual training exercises, sequences, and general practices as indicated in school catalogs and circulars, and after becoming familiar with the recent history of manual training and its diverse aims in different localities a course of study is planned for public schools involving a variety of materials and processes, and yet with a continuous aim and carefully graded steps. The practicability as to teaching in public school classes is made an important element in determining the value of any educational scheme of hand work, worked out by members of the class.

MANUAL TRAINING EQUIPMENT. The aim is to enable students to solve some of the problems that must be considered in planning, equipping, and maintaining a manual training room or building in an efficient and economical manner under any special set of conditions.

The work is carried on through lectures, required reading, class discussions, and the making of plans and drawings of buildings, rooms and fittings, and the working out of specifications and costs of tools, supplies, and general equipment. Following are the problems taken up and the topics considered:

Fitting up a woodworking shop in a public school building.

Planning a manual training building to meet special needs.

Arranging benches and machines in the various shops.

Designing the following to be built or fitted up in the school: General tool closet, lumber storage room, finished model closet or cabinet, tool panel, joinery bench with drawers or tool rack, blue printing apparatus, drawing table, cabinet for drawings, rack for iron and steel stock.

Selecting general equipment from dealers.

Selecting tools for the various shops in building previously planned (see Stout Bulletin, August, '06).

Estimating costs of tools and equipment in various shops (see Stout Bulletin, August, '06).

Selecting tools and supplies from dealers; reliable dealers in manual training supplies; the best sources,—manufacturer, wholesale dealer, and local firms.

Estimating costs of materials used in various subjects (see Stout Bulletins, February, '07, and May, '07).

GENERAL SUBJECTS

ENGLISH. Presentation of such phases of composition work as will give the student a command, both in speaking and writing, of simple, correct, and clean-cut English, is the aim of this course. The special topics considered vary with the needs of particular classes, but in general they may be designated as: grammatical forms; sentence structure; choice of words; social and business correspondence; the preparation and organization of literary material.

The work is closely correlated with that in other departments and is based on long and short themes, talks, discussions, and papers presented by members of the class.

A special feature of the work in English is the training in oral exposition and description. The tools and materials used, processes employed, and products completed in the construction work furnish many of the topics for these exercises. This work is continued throughout the course for the purpose of developing ease, facility, and accuracy in the student's subsequent use of English as a teacher in the class-room.

ELECTIVES. Work in literature, or courses selected in the domestic art or science or in drawing will be taken as the equivalent of one hour daily throughout the course. In the selection of electives, students will be expected to advise with and secure the approval of the director of the training school.

PHYSICAL TRAINING. Regular work in the gymnasium and natatorium is taken throughout the course unless students are excused by the director for cause. Several periods each week are given to exercises, games, swimming, and normal gymnastics, two periods being required of all students.

Stout Institute Athletic Association encourages basket ball and base ball and puts out good teams each year.

DOMESTIC SCIENCE SCHEDULE

JUNIOR YEAR

SEMESTER SUBJECTS ARE GIVEN		NUMBER PERIODS PER WEEK	NUMBER OF WEEKS	TOTAL NUMBER PERIODS
1 & 2	Psychology and Pedagogy	5	18	90
1	Food Study	5	18	90
2	Physiology and Home Nursing	5	18	90
1 & 2	English	5	12	60
1 & 2	Inorganic Chemistry	6	18	108
1 & 2	Organic Chemistry	8	18	144
1 & 2	Cooking	6	36	216
1	Model Sewing	4	18	72
2	Plain Sewing	4	18	72
1 & 2	Drawing and Design	6	18	108
1 & 2	Mechanical Drawing	6	12	72

SENIOR YEAR

1	Dietetics	6	12	72
2	Household Management	5	12	60
1 & 2	Organization and Management	4	6	24
1 & 2	Observation and Practice Teaching			
1 & 2	Biology	6	18	108
1 & 2	Physiological Chemistry	6	18	108
2	Food Adulterations	2	12	24
1	Cooking and Serving	6	18	108
2	Advanced and Demonstration Cooking	4	18	72
1 & 2	Dressmaking	6	36	216
1 & 2	Millinery and Art Needlework	4	36	144
1 & 2	Textiles	3	9	27
2	Primary Handwork (optional)	4	18	72
1 & 2	Interior Decoration and Furnishing (optional)	10	36	360

GRADUATE COURSES

Science, Dietetics and Dressmaking, Professional Work, Interior Decoration and Home Furnishing.

OUTLINES OF COURSES

DOMESTIC ECONOMY TEACHERS

DOMESTIC SCIENCE, DOMESTIC ART AND DOMESTIC ECONOMY are the various terms that are applied to the lines of work here grouped under Domestic Economy. The term is not satisfactory, but is used because it is the one more often used and more generally understood to include the full range of subjects than the others. The scope of the subject matter here outlined covers the following points: Foods and their uses, cooking, general science, sewing, millinery, textiles, drawing and house decoration, emergencies and home nursing, household management, and professional subjects.

FOODS AND THEIR USES

FOR a knowledge of foods and their uses to be of practical benefit in improving dietary conditions, it is necessary that there be a thorough understanding of food stuffs which will lead to intelligent selection, combination, and preparation of foods and a thorough understanding of the physiological requirements of food in the body.

This practical knowledge is obtained in the following courses of study by a careful consideration of food compositions, digestibility, ease of assimilation, specified food values, etc., and by a consideration of the industrial aspect of food production, including the factors that influence food value, appearance, and cost.

Professional value is given by a full and systematic scheme for food study that will furnish a teacher available information without the necessity for collecting it from various sources of information.

FOOD STUDY. A complete and systematized study of all foods to show composition, structure, nutritive ratio, digestibility, cost, and place in the diet. It includes a study of the chemical and physical changes which take place in foods during cooking, and the effect of various temperatures on the digestibility and food value of the various foods. Work in food study is closely correlated with the work in junior cooking so that one complements the other.

Food defined and classified, uses of each class in the body, importance in the diet. Elements and compounds found in the body, importance of knowledge of chemical composition of the body and chemical composition of foods required to maintain it.

Cell as a body unit, parts, how maintained. Digestion, absorption, assimilation, excretion, reviewed to make clear cell metabolism.

For detailed work in study of foods they are classified as animal and vegetable foods.

For study of proteids, fats, and carbohydrates the classification used in work in food chemistry is taken.

An exhaustive study of all vegetable foods under the division of roots and tubers, cereals, legumes, green vegetables, and fruits. Study of heat units, nutritive ratio, and balanced ration to make clear the food value of the typical food of each class, and the place of each food in the diet.

Study of animal foods under the divisions of meats, fish, eggs, milk and its derivatives.

Time is given to discussion of place of food study in various school courses and its relation to other courses.

Discussion of essentials and methods of presenting work.

DIETICS. The purpose of this course is to present the fundamental principles of human nutrition and their application to the feeding of individuals, families, and larger groups under varying physiological, economic, and social conditions. The course aims to relate and apply the principles given in the study of foods and their preparation, physiology, and physiological chemistry. It includes recitation and laboratory work and is designed to be used as a basis for practical work in dietetics as well as for organizing and teaching the subject in the high school.

The subject matter includes:

Review of the chemistry and physiology of digestion.

Metabolism of proteids, fats, and carbohydrates.

The influence on metabolism of structure, bulk, and palatability of foods.

Outline of dietary investigations.

Modern dietary standards and their practical application.

Testing the average normal dietary and diet fads by established dietary standards.

Special diets for children and the aged.

Foods for diseased conditions, studied by types—diet in disorders of digestion, assimilation, excretion; diets for fevers, colds and the ordinary contagious and infectious diseases.

The laboratory work consists of:

The estimate of the calorific value of foods in portions yielding 100 food units.

Comparison of foods as to relative cost and nutritive value.

Computation of daily energy requirement for groups of people in different occupations.

Computation of dietaries fulfilling the energy requirement at a suitable cost.

Preparation of meals in dietaries worked out for special conditions and comparing the theoretical quantities of food with the actual quantity of food consumed.

COOKING

FOR convenience in arrangement, the work in cooking is divided into three subjects, junior cookery, advanced and demonstration cooking, and invalid cooking. While it is impossible to classify all of the work under these three heads, this arrangement will give an idea of the lines of work conducted in each year of training. The training value of these lines of work and the professional aims are nearly the same, the practical purposes differing with the subject. The practical purpose may be stated in general terms as an effort to show the relation of science and practice, to teach the art of cooking, to develop skill and judgment in the use of materials, to develop correct ideals of neatness, order, system, economy, and habits that will be valuable in attempting to realize these ideals. The professional aim is to show the development of the subject as teaching material, to show adaptations to school purposes, methods of presentation, and training value.

JUNIOR COOKERY. The following topics indicate the scope and plan of the work.

Food principles—Theory of cooking and application to simple foods, cereals, starchy vegetables, green vegetables, meats, eggs, cheese, fats, etc.

Combinations of food materials—based on knowledge of composition and involving study of chemical and physical changes that occur in cooking.

Cooking processes—Their relations to different foods. Comparison of methods of cooking and effects on foods.

Development of skill in manipulation of materials and utensils—obtained by practice.

Study of recipes—Comparison and grouping according to typical forms; methods of formulating; proportions essential. Working out of original recipes.

Dietetic value of foods prepared—Place in diet and meals.

Invalid cookery—Preparation of dishes suitable for sick and convalescent. Adap-

tation of diet to special diseases. Laying of invalid tray.

Economic considerations—Emphasis on avoidance of waste by utilization of time, labor and materials to best advantage.

Housekeeping—Its connection with cookery and relation to school kitchen. Care and order of utensils and apparatus.

Professional standpoint—As well as practical, constantly emphasized. Teaching suggestions as to methods and courses of study.

ADVANCED AND DEMONSTRATION COOKING. This course gives practice in several phases of cookery, in selection and marketing of foods, making menus and serving meals. Especial attention is paid to the economic consideration of wise expenditure of time and money in food preparation. The processes carried out are more elaborate than in the Junior year and self-reliance on the part of the student in the plan and execution of her work is encouraged.

Food preservation—canning fruits, making preserves, jelly, pickle, experiments with different methods of canning fruits.

Food preparation—meats, breads, cakes, pastry, salads, ices, etc.

The menu—planned to meet physiological needs, with reference to availability of food in the market, cost of food and economy in labor.

Table service—form—its controlling factors, use of garnishes, adaptation of standard forms to existing conditions.

Serving of meals—individual work.

Large quantity cooking and serving—class work in preparation and serving of banquets for large numbers.

Demonstration cooking—The use of cookery to illustrate the lecture on principles and processes of cookery and the subject of foods; discussions, individual exercises.

INVALID COOKING is given for the purpose of teaching the preparation and serving of food for the sick and the adaptation of diet to disease.

Gruel—barley, oatmeal, arrowroot.

Broth—beef tea, mutton, chicken.

Soups—cream, fruit.

Beverages—tea, coffee, cocoa, lemonade, toast-water, sodas, fruit syrups,

Eggs—nog, poached, shirred, etc.

Toasts and twice-baked breads.

Jellies—gelatine with fruit juices and wines, Koumiss.

Cereals—correct preparations for invalid.

The invalid tray—laying of tray, garnish, china.

GENERAL SCIENCE

SCIENCE courses here outlined are not designed to give the student a comprehensive knowledge of the fundamentals of the subjects studied and are not detailed science courses in the usual sense of the term. Only such phases of the different subjects are dwelt upon as find application in practical home management, and such fundamentals are taught as are necessary to an understanding of these applications. The aim in teaching is not professional but to give a basic understanding of the relation of science to the practical matter of the home.

PHYSIOLOGY. This course of study is planned for the purpose of teaching the student of the human body the functions of its various organs with special reference to the physiology of nutrition and the maintenance of a healthy organism. It also shows a systematic arrangement of the subject matter and the organization of a course in physiology suitable for eighth grade and high school pupils with the best method of presentation.

The human body as an organism made up of cells, tissues, organs.

The amoeba—its manner of growth, nutrition, excretion.

The body cell—cell activity, interdependence, food requirements.

Blood manufacture—digestion, digestive juices, absorptions, assimilation, excretion, hygiene of digestion.

Blood—its composition, physical properties.

Circulation—organs, systems.

Lymphatic system—blood modification, influence in blood composition.

Skeleton—structural frame work, bones, joints.

Muscles—voluntary, involuntary, active.

Respiration—organs, influence upon oxidation, hygiene.

Skin—structure, functions.

Kidneys—structure, functions, selective power.

Nervous system—structure, functions, activities.

Senses—touch, taste, smell, sight, hearing, voice, and speech.

INORGANIC CHEMISTRY deals with such phases of general chemistry as are essential to an understanding of food chemistry rather than to an understanding of general fundamentals. The following are the principal topics considered:

Matter—kinds, changes, properties, forms, elements, compounds, mixtures.

Chemical reactions—definition, conditions superinducing, characteristics, quantitative aspect, proportions, equations.

Water—compositions by volume, by weight; properties—chemical and physical; solution—kinds, states, circumstances affecting, characteristics, applications of theory of electrolytic dissociation; purification—boiling, filtration, distillation, chemicals, oxidation, city purification.

General outline—elements considered as metals and non-metals; compounds composed of metallic and non-metallic oxides; bases—nomenclature, definition in terms of ion theory, formation, reactions; acids—nomenclature, definitions, reactions; salts—nomenclature, definition, formation, reactions.

Atomic theory,

Determination of atomic weights—determination of equivalent, molecular weights, deduction of atomic weights.

Valence.

Periodic law of the elements.

FOOD CHEMISTRY is essential to the understanding of food materials and the reactions which occur in their preparation for use. The course is planned to give this scientific basis for the practical work and to emphasize the essential materials by the analysis of a complete food.

Carbon compounds—hydrocarbons, including the aliphatic series of paraffines, olefines, acetylenes, alcohols, ethers, aldehydes, ketones, acids, esters, and the aromatic compounds made up of the benzene series and the derivatives of benzene; fats; carbohydrates—the monosaccharides, hexoses, mannose, dextrose, levulose, galactose—the disaccharides, sucrose, lactose, maltose—the polysaccharides, starches, gums, cellulose.

Nitrogen compounds—proteins considered according to Webster-Koch classification, alkaloids.

Mineral compounds.

Proximate analysis of milk; ash, moisture, fat, carbohydrate, protein.

FOOD ADULTERATIONS. Following the course in food chemistry, this course is considered an important adjunct to it. The object is to give the student information concerning the common adulterations and the foods in which they most frequently occur.

Classes of adulterants—preservatives, coloring matter, substitutions, artificial essences, mineral compounds.

Foods commonly adulterated—milk, butter, olive oil, lard, sugar, syrups, flour, baking powder, canned products, ketchups and sauces, fruit extracts.

Testing foods for adulterants.

PHYSIOLOGICAL CHEMISTRY. Prerequisites to this course are the ones in food chemistry and physiology. The aim is to show the chemical reactions within the body and the results of these reactions.

Human body—gross structure; internal structure of respiratory organs, alimentary canal, circulatory and lymphatic systems; cell structure, composition, necessary foods; tissues and secretions, blood, various fluids, muscles, nerves, bones, fat.

Foods required by the body.

Processes of digestion—mouth digestion provides mastication, solution of foods, diastatic action, and involves a consideration of the salivary glands, their kinds, location, secretions, and of saliva, its composition, properties, diastatic action, limitations, agents retarding—stomach digestion includes a study of the glands of the mucous membrane, kinds, occurance, character of secretion; secretions, their composition, conditions exciting flow, influence of blood, etc.; action of juices, conditions retarding and promoting rapidity; special action of pepsin, rennin, gastric lipase—intestinal digestion includes a similar study of the pancreatic juice, intestinal juices, and bile.

Paths of absorption of digested foods—lacteal or lymphatic systems as carrier medium, necessary conditions, foods absorbed, changes during absorption; the portal system as carrier medium, process, foods carried, changes in food during process.

Metabolism—constructive, conveyance of foods to cell, importance of capillaries, building up of absorbed foods into living tissues; destructive decomposition of foods and liberations of energy, disposal of waste materials.

Products of metabolism—tissues and secretions, excretory products, source of muscular energy, heat equivalent of some common foods.

BIOLOGY

BIOLOGY shows the relation of cell growth, nutrition, and activity to organic development. The particular phase of biology emphasized is bacteriology, the purpose being to show the influence of simple forms of life, such as bacteria, yeasts, molds, etc., upon food materials, the human organism, and sanitary conditions surrounding both.

Life—its purpose in the organization of materials.

Protoplasm—physical and chemical nature, occurrence, properties, tests.

Cell—unit of organization, occurrence, size, shape, composition, physiology of parts, advantages and purposes of cell structure.

Cell activity—osmosis, plasmolysis, turgidity, tissue tension.

Cell growth—ametotic and mitotic formation, stages in nuclear division and cell division from mother to daughter cell, differentiation of cells into tissue, regions of growth, necessary conditions.

Reproduction—sexual, asexual, meaning, development.

Heredity and variation.

Bacteria—form, size, shape, method of growth, rapidity of growth, spore formation, motility, classification, occurrence, conditions necessary for growth. Effects of bacterial growth demonstrated in the laboratory. Distribution of bacteria may occur through soil, water, air, foods. Methods of combating them are sterilization, use of preservatives, disinfectants, cold storage. The theory of germ diseases is discussed under the following topics. Channels of infection, susceptibility, disinfectants, deodorizers, antiseptics, heat, light. The formation of toxins and use of anti-toxins is illustrated in various diseases.

Yeast—characteristics, classifications, conditions for growth, occurrence, use, combating wild yeast, fermentation and its effects.

Molds—nature of growth, when it grows, appearance, structure, reproduction, classification, germination of spores, methods of combating.

Mildews—kinds, place and time of development, method of reproduction, how checked.

Smuts—their harm to grains, history, effects.

Higher fungi—brief discussion showing economic relations and importance.

SEWING

THE courses in sewing have a two-fold purpose, the first being to present a systematic, well developed course of instruction that shall develop judgment and skill on the part of the student. The second purpose is professional, being to give a content from which courses of study may be organized and to show the development of the subject matter, its teaching possibilities, methods of presentation, and class management. The

complete course includes model sewing, plain sewing, dressmaking, and art needle work.

MODEL SEWING includes a course in the making of models of the various steps in sewing to be preserved as illustrative material in teaching. Applications of the models are made upon articles of use and simple garments.

Canvas work—samples of the various stitches, running, basting, etc.; applications to mats, bags, handkerchief cases, any small, useful article upon which stitches may be used.

Hems and hemming—paper and cloth models of straight, round corner, and mitred cornered hems; application on small pillow case or sheet.

Ruffles and bands—practice ruffle set into band, application on small apron.

Darning—weaving on cardboard to show warp and woof; stockinet darn on model, on worn stockings; cloth darns on models showing straight, bias, corner, patched darn; damask darn—diagonal, herring-bone, diamond, square, figured; applications made on worn garments, and in ornamental darning on crash for pillow covers, table runners, center pieces. Where ornamental darning is used, pupils make their own designs.

Patching—patches of various shapes, round, square, hemmed, etc.; matching of stripes, and plaids; application to garments.

Linen work—plain, and fancy hemstitching, simple drawn work, pattern weaving in borders; applications to towels, and household linens.

Flannel work—seams of various kinds, opened and catch-stitched, felled, bound; fancy stitches—feather stitch, coral stitch, chain stitch, blanket stitch; patching on flannel; use of binding ribbon.

Button holes—on muslin with round corners, barred corners, overcasting; on wool with round corners, tailored corners; eyelets, and loops.

Sewing on buttons, tape, hooks, and eyes.

Trimming for white work—tucking, rolled edge, putting in insertions, laces, embroideries; fancy stitches used for trimming.

Application of preceding points to model underskirt made half size.

PLAIN SEWING consists of the making of a four-piece set of undergarments and any other simple garments for which there may be time. The garments are standard size, drafted to measures, and show in their finishing an application of the steps taught in model work.

DRESSMAKING. The purpose here is to teach the art of dressmaking—the use of a system of drafting by which patterns and designs are made, the designing of ordinary garments, the use of line, proportion, color and adaptation of materials and to develop neatness, accuracy, self reliance, originality, and high ideals of work. The professional ideal is also kept in mind.

Shirtwaists—draft of plain shirtwaist and sleeve to different measurements in order to learn use of system; design of shirtwaist patterns in paper, three designs made to specific directions, two original designs; tailored shirtwaist designed and drafted from individual measurements; models of sleeve placket, and cuff; cotton shirtwaist made from preceding designs and models.

Skirts—drafts of seven gored, nine gored, flared skirt made to specific measurements; wash skirt made from designs and patterns from actual measurements; flounces designed in paper from specific measurements, fitted, circular, pleated, two originals; skirt designs in paper in full lengths with pleats in sides, tucked skirt with solid tucks and box pleated backs, pleats set in below hips, models of seams on woolen cloth—bound, felled, lapped; pressing of seams; woolen skirt made from patterns designed and drafted from actual measures and application of models.

Silk or wool waist—design and draft from actual measures; selection of materials and trimmings; cutting, fitting, and finishing of waist.

Morning dress of gingham, percale, or linen—patterns and designs made to individual measurements, and to suit individual style.

Afternoon dress of batiste, dimity, or other thin material—same as above.

ART NEEDLE WORK is planned to give training in the application of a knowledge of design and skill in fine needle work to the finishing or decoration of articles of clothing or house furnishing. The different lines of art needle work are considered under the heads given below and worked out upon articles chosen by the students.

Characteristics of design suited to various lines of needle work.

Design—adaptation to particular line of needle work.

Articles suited to kind of finish or decoration.

Materials suited to finish, decoration, design.

Study of materials—source, selection, combination, cost.

Needle work stitches and finishing.

Kinds of work—hem stitching, darning, applique, cross stitch, scallops and dots, Wallachian, cut work, eyelet, Bermuda fagoting, French embroidery, drawn work, Irish crochet.

MILLINERY

IN THE treatment of fall and spring millinery, an opportunity is given to develop skill in the handling of materials and taste in their selection and combination, as well as to teach the art of designing, making and trimming hats. In the professional treatment of the subject, emphasis is placed upon equipment, materials, prices, best places to obtain.

Fall millinery—wire work including preparation of wire, bandeaux, buckles, frame making; renovating and cleaning of velvet, felt, feathers, lace, ribbons, chiffon; tinting by the use of gasolene and oil paints, colored powder and chalk; making of bows of tissue paper; proportions in hats; study of styles, making comparisons with preceding seasons; remodeling; sources and value of materials used in hats; millinery stitches—fly-running, back stitch, saddler's lacing; preparation of folds, points, ears, rolled hem, and other trimmings; making of buckram frame from original design; making, covering, trimming, and lining of winter hat; discussion of selection of materials and cost.

Spring millinery—study of styles, discussion of materials, remodeling of old hats, review of frame making, making of street hat, including wire frame, covering, straw sewing, trimming, finishing; making of lingerie hat from embroidery, lace, or net.

TEXTILES

THE purpose of this course is to give a practical understanding of the various textile fibers and processes of their manufacture that shall lead to judgment and taste in selections suited in wearing quality, adaptability, permanence of color, and harmony of design to the particular use for which they are intended.

Development of preparations of fibers—spinning, its history, processes, present methods; weaving, early forms, movements in weaving, kinds of looms; weaves and kinds of cloths in which used, plain, twill, sateens, rib, basket.

Study of fibers—vegetable fibers, plumose, cotton, flax, hemp, jute, ramie; animal fibers, silk, wool; mineral fibers, asbestos.

Cotton—distribution and production as influencing quality and cost, steps in handling, operations in milling, products of milling, characteristics, adaptations to use, prices, wearing qualities.

Flax—practically same as above, adding a comparison of linen and cotton in price, appearance and wearing qualities.

Silk—characteristics, treatment of cocoon, milling operations, artificial silks, milling products, same points as in cotton.

Wool—practically same as silk.

Dyeing—definition, effect upon fibers, elements, color, mordant, assistants.

DRAWING AND ART WORK

Lines of work include the subjects and modifications of subjects needed by the student to carry on practical applications of house planning, furnishing, use of design, use of color.

MECHANICAL DRAWING consists of a course of exercises that will enable the student to acquire a knowledge of the principles of projection and perspective with the application of these principles to working drawings.

The course consists of sheets of lines, letters, and dimensions, projection of solids, projection of prism at angle, projection of prism at double angle, perspective of prism, perspective of chair and table in room, working drawings of tables, drawings of cabinets, drawings of cupboards, plans of rooms, including school kitchens, house plans, house elevation, room development.

DRAWING AND DESIGN include such principles of design, color, and sketching as are needed in carrying out the lines of work. Only work having direct application is undertaken as the purpose is practical rather than professional. The course includes:

Drawing—life and object, still life studies, selected from objects to be used for illustration, life from the human figure.

Design—space and proportion, the use of stripes, plaids, squares, oblongs, triangles, circles; surface design—spots, borders, stencils, block printing, embroidery, applique, darning.

Color—composition, harmony by analogy and contrast.

Millinery—drawing frames, bows, trimmings; original designs; color combinations.

Garment making—sketching from life and object; underwear, design and trimming; costume designing, proportions, color combinations.

Blackboard illustrations—presentation of subject matter.

INTERIOR DECORATION AND FURNISHING. The purpose of this course is two-fold,—to prepare students to create an artistic home environment, and, out of their knowledge of the basis of art and good design as applied to interiors, to evolve a course of study that can be successfully carried out in public schools under present conditions and find direct application in the homes of the pupils. The general course of study follows:

Design—nature applied to design, historic ornament, original designs and adaptations; applied design—wall decorations, stencils, block work.

Color—composition, harmony, light, physical effects, psychological effects.

House planning—for convenience, for artistic effect. Each pupil is required to plan a house of a given number of rooms at a given cost, and must carry out her plans in detail, showing floor plans, elevations, and views of the interior showing color schemes, decorations, and furnishings.

House decoration and furnishing—color combinations suited to design and use; finishes for walls, floors, woodwork; textiles used for floor coverings, hangings, curtains, cushions; ornaments—pictures, pottery, china, bric-a-brac; furniture—use, materials, form, and ornamentation.

PROFESSIONAL SUBJECTS

IT is necessary that the students understand the professional as well as the practical and economic bearing of the subject. Many of the training possibilities of the various lines of work are emphasized in the regular course of instruction, attention being called to the mental processes involved, the specific training value, the organization of material, the presentation of subject matter, using the regular class work to illustrate processes. The actual organization and handling of public school classes of different grades gives opportunity to acquire, at first hand, knowledge of the stages of development of pupils of different ages.

The professional work may be included in the following general topics: Psychology and pedagogy, observation and practice teaching, a study of the organization and management of classes, and of the organization of courses of study and planning of equipment.

PSYCHOLOGY AND PEDAGOGY—See under Manual Training Outline of Courses for scope of work.

OBSERVATION AND PRACTICE TEACHING. Throughout the senior year practice teaching is carried on under the supervision of a critic teacher. Different lines of work and different grades are handled according to definite plans and in accordance with regular public school discipline and ideas of individual development.

GENERAL ORGANIZATION AND MANAGEMENT. The following course has as its aim the working out of the relation of the subjects of instruction included in a complete domestic science course and the indicating of the peculiar training possibilities of each line of work as well as the organization of the practical information needed by a teacher in introducing or conducting the work.

History and status of Domestic Science in schools.

Practical and educational purposes in its teaching.

Scope of the subject; sciences—chemistry, physiology, biology, physics; art—use of colors, design, house decorations, designing of costume, etc.; economics—relation of home to surroundings, social and industrial.

Place in course of study—relation to other lines already taught, sequence of work as determined by psychological and physical principles.

Planning of courses of study—influence of environment, development of pupil, possibilities of school system.

Organization of classes—records, attendance, standard of class marking.

Presentation of subject matter—preparation for lesson, lesson plan, preparation of materials; presentation, theoretical treatment, method of conducting, practical application.

Study of equipment, rooms—plans, dimensions; furnishings—kinds, cost, where obtained.

Cost of maintenance.

The special teacher—attitude toward other lines of work, relations with regular teachers, supervision and conduct of teachers' classes.

GENERAL SUBJECTS

Under this head are grouped subjects that do not logically fall under the other main headings.

EMERGENCIES AND HOME NURSING. This course gives the practical treatment of simple ailments of the human body and methods of handling emergencies that may occur in the home, the school, or elsewhere.

The sick room—location, furnishing, ventilating, care.

Beds and bed-making—lifting, and handling patient.

Baths and bathing.

Observation of temperature, respiration, pulse, administration of medicines.

Local applications—plasters, poultices, blisters, and other counter-irritants, hot and cold compresses.

Contagion and disinfection—infectious diseases, modes of propagation, fumigation, and disinfection.

Emergencies—fainting, drowning, scalds and burns, frost bites, hemorrhages, sprains and fractures, poisons and antidotes.

Bandaging.

Study of diseases—tuberculosis, typhoid fever, colds, etc.

HOUSEHOLD MANAGEMENT furnishes an opportunity to assemble the numerous lines of instruction and fields of experience necessary to administer the affairs of a household into one general course. The primary practical purpose of this line of work is to show the relations of science, art, economics, and practical application.

Because of the scope of the subject and the necessity for little equipment in its teaching, household management presents greater teaching possibilities than many lines of instruction. The development of the subject, its training value, and methods of presentation are included as a part of the instruction.

For convenience in treatment, the general subject may be subdivided as follows:

House sanitation—location, construction, heating, ventilation, lighting, plumbing and drainage, cleaning and cleansing agents.

House furnishing correlates closely with the work in household decoration and furnishing, carrying the theoretical suggestions into practical application in selections and estimates of costs. The furnishings considered include floors and floor coverings, wall finishes and covers, curtains and draperies, furniture, fittings, and utensils—china, silver, linen, crystal utensils.

Business organization—apportionment of income for food, shelter, clothing, education, charity, culture; household expense accounts; system in management of work and business; purchasing of materials.

Social, industrial, and ethical relations—labor in the home, the home as a factor in disbursement, the individual's relation to the home organization, the moral obligations of the home to society.

ENGLISH as given in connection with the Domestic Science courses is designed to aid the student to overcome bad habits of speech and writing. Oral topics relating to the special subject form the nucleus of the recitation work. For written work, daily paragraph themes illustrating various methods of presentation and exposition are required for the larger part of the course, outlines for all oral topics are prepared, and at least one long theme is written. In the paragraph theme attention is paid to matters of punctuation and correctness of idioms rather than to grace of style.

PHYSICAL TRAINING. Opportunity is offered to students for physical training in regular classes in the gymnasium and natatorium.

ELECTIVES. Literary readings, or work selected from the manual training or drawing courses, will be taken as the equivalent of one hour daily throughout the course. In the selection of electives, students will advise with and secure approval of the director of the department.

OUTLINES OF COURSES

HOMEMAKERS

FOR convenience in arrangement, the subjects are grouped under the following heads: The House, Food Study and Preparation, Clothing and Household Fabrics, Care of Children, Home Nursing and Emergencies, Home and Social Economics, English, Literature, Drawing and Design, Physical Training.

THE HOUSE

HOUSE SANITATION. The study of House Sanitation is dependent for its greatest value upon an understanding of the sciences of chemistry, physics, and bacteriology and an appreciation of their application to such subjects as the heating, lighting, ventilation, and plumbing of a house. The sanitary requirements in the way of house location, in obtaining pure water supplies, and in maintaining absolute cleanliness of surroundings as well as the furnishings and materials in the house, have their source in scientific principles that should be applied in the locating or selecting, planning, and care of the house.

INTERIOR DECORATION AND FURNISHING. House Decoration and Furnishing is a subject that has only recently claimed the attention of the average individnal. The ability to create an artistic and harmonious environment has been considered a special gift to the few. The majority, through lack of training, have had to content themselves with existing conditions that as often as not have violated every principle of good furnishing and artistic decoration. Today it is realized that the woman who is to plan and furnish a house needs some instruction that shall be of use to her in creating a home where beauty and harmony and perfection of form shall produce an environment conducive to right living.

That this may be accomplished, a course is offered in design, color, house planning, decoration and furnishing, and the opportunity provided for practical application in all lines of art relating directly to homemaking.

HOUSE MANAGEMENT. The organization of a course of study in House Management is practically impossible unless there be opportunity for direct application of the principles taught. This application may be obtained under existing conditions in the cottages where the young women live during the school year. That the full benefit of experience may result, there is a definite course of instruction in each of the phases of house management and such actual performance of duties as may be necessary to a thorough understanding of the principles involved.

These duties are so varied that they include all lines of activity found in a home, but in the correct organization of such varied duties each assumes its proper proportions and the result is a well regulated system for the performance of the business of the household.

BUSINESS MANAGEMENT IN THE HOME. The value of a broad training that will fit women to discharge the business of their households, that will give them adequate results for money expended and give them a better appreciation and estimation of values cannot be too strongly urged.

The proper apportioning of the income among the different lines of home expenditures, the systematizing and keeping of household accounts, the selection of materials for the home, the organization and division of labor, the question of domestic service are all topics considered in their economic relations in the theoretical discussions of the subjects and in their practical application in the supervision and care of the Homemakers' cottages which is a part of the regular second year course.

FOOD STUDY AND PREPARATION

CHEMISTRY. The course in Chemistry includes a study of the simple elements of general chemistry necessary to a comprehension of the relation of this science to the care of the home and its occupants.

This relation is shown in a study of food composition, food combinations, chemical processes in the preparation and digestion of foods, food adulterations, the determination of food values, the chemical processes involved in the cleaning operations in the home—soapmaking, removal of stains, cleaning of metals, woods and wood finishes; general laundering processes; in relation to fabrics, in the study of dyes and their influence upon quality and durability.

BIOLOGY. A study of the influence of plant and animal life on food material, of the production and storage of food material in plant and animal tissue, and of bacteriology in its relation to food preservation and to the preservation of health.

Household Bacteriology invites a study of physical and chemical changes induced in food products by the growth of molds, yeasts, and bacteria, a study of the conditions necessary for this growth, and a consideration of these organisms from the standpoint of house sanitation. It also includes a study of bacteria in their relation to diseases—sources of infection, types of infection, the principal infectious diseases, personal and household disinfection.

PHYSIOLOGY. A study is made of the uses of food materials in the body—digestion, assimilation, storage of energy, excretion of waste materials; a study of the influence of hygienic living upon physical well-being—correct food, exercise, rest, sleep, regularity of habits, cleanliness, correct clothing, and proper general habits of life; an application of the principles of physiology and hygiene to the physical improvement of individuals in the home and to the health conditions of the home itself.

DIETETICS. A study dependent upon a knowledge of chemistry, biology, and physiology, in which is considered the suiting of food substances to the particular requirements of the body in health and disease, the influence of age, climate, and occupation upon the kind and amount of food used and upon its manner of preparation.

The practical application of this course is made in the planning of dietaries suited to different conditions, the working out of the balance of food materials found in each, the actual weighing, preparing, and serving of the dietaries to test their practical character and to verify the amounts used.

SELECTION OF FOOD MATERIALS. The selection of food materials involves a decision as to the amount of money to be expended upon food, a study of the markets and available foodstuffs, a knowledge of manufacture and methods of production in their influence upon the character of foods, a knowledge of the food value of various foods, and the ability to substitute less expensive materials, having the same food value, for the more expensive ones.

A definite course in marketing combining the selection of materials with the keeping of household accounts constitutes a part of the course of the senior year. This is conducted in connection with the supervision of the cottages and the planning and ordering of the meals and continues such time as is necessary to gain some proficiency in this particular line of work.

CARE OF FOOD MATERIALS AND FOODS. The correct care of food materials before preparation and of foods after preparation, means an enormous saving in expenditure for food materials and a saving in actual food value in the materials themselves.

This involves a knowledge of the action of yeasts, moulds, ferments, and other forms of bacteria, and the ability to apply the scientific principles underlying practical food preservation.

PREPARATION OF FOOD. The actual preparation of food, if it is to be of highest value, must be considered with reference to its effect upon the food value of the materials used and with reference to the particular use to which they are to be put. This naturally requires a consideration of suitable food combinations and the actual preparation of foods.

This preparation includes the application of the principles of cookery to the foodstuffs that are in common use in the average American home. Special emphasis is placed upon the preparation of palatable and attractive foods from the less expensive materials. The combination of these foods into meals will give experience in actual practical preparation and will be continued until a sufficient degree of efficiency has been acquired.

A course in invalid cookery supplementary to the study of home nursing is included in the advanced work in cookery.

SERVING. Serving is supplementary to cookery, and in addition to the regular serving of simple meals includes the serving of luncheons, dinners, and meals of ceremony and entertainment, the decoration of tables, duties of a host, hostess, and waiter, and the entertainment of guests.

Opportunity to gain skill in serving is given in connection with the discharge of regular duties in the care of the cottages. All such work is conducted as regular class exercises and under the direct supervision of the director of the department.

CLOTHING AND HOUSEHOLD FABRICS

CLOTHING. The problem of selecting fabrics and combining them into garments and articles for the use of the household is one that requires training in the knowledge of materials, in the knowledge of their wearing qualities, their real, not their apparent values, their care, the suitability of their combination as to color and quality, as well as skill in the use of materials and the ability to make, or direct the making of common household articles of use and the clothing of the family,

In considering the clothing for the use of the family such attention must be given to hygiene as will result in the selection of materials and shapes of garments that will aid, instead of impeding, physical development; attention must be given to color and form, harmony and appropriateness, that the clothing may be suited to the physical peculiarities of the individual for whom it is planned, adapted to the peculiar uses of the individual, and attractive because of its appropriateness for the individual. The comparative cost and quality of fabrics must also be studied, that the expenditure for clothing may be proportioned to the expenditure for other necessities, and that correct standards for this particular phase of expenditure may be established. The repair of clothing is also a problem that needs careful attention, for unless proper care is taken of the wearing apparel, much money is uselessly expended and little satisfaction and comfort result from it.

The care of clothing when not in use affects materially its durability, correct storing being absolutely necessary to secure the full wearing value. The actual cutting, fitting, and making of clothing demands a skill and judgment that comes only with experience and practice.

FABRICS USED FOR DECORATIONS AND FURNISHINGS.

The selection, construction, and care of other fabrics used in the household demand attention along the same lines as the selection of clothing, with an additional emphasis upon the possibilities of applying a knowledge of design and color to the construction and decoration of draperies and other articles of furnishing.

The course to be effective includes a study of textiles, design, and color; practical application in selection of materials; the fundamental principles of sewing, mending, and repairing; the making of plain garments, children's clothes, etc.; the designing and making of dresses and hats; the making and marking of household linens; the uses of embroideries and fancy needlework; and the application of needlework to various forms of household decoration.

THE CARE OF CHILDREN

A CHILD has a right to the care that will prepare him for his life work, whatever it may be; the difficulty is to assure this care to the average child in the average home. One solution of this difficulty is a definite and systematic course of instruction for young women that will aid them in fitting themselves to discharge the duties that devolve upon those responsible for the care of children.

This course includes a study of child nutrition; of the hygiene of childhood, including bathing, clothing, amount of sleep, exercise, amount of pure air, regularity of habit, absolute cleanliness of the individual and the environment; the consideration of infant diseases and emergencies; and the selection, making, and care of clothing. It also includes a definite and distinctive study of child psychology.

If a well rounded nature is to be the result of the home training, there must be an understanding of the stages in the mental development of the child, of the value of the creation of correct ideals, an appreciation of the force of will power well directed, and of the value of the formation of correct mental and moral habits, no less than an understanding of the physical necessities of childhood.

The varying and developing ethical code of the family is noted from the time of the primitive family to the present, the training of the primitive child for self protection only, and of the modern child for virtue as well. The subject of virtue is considered in so far as it requires a certain choice between two lines of conduct and the exercise of the will to carry out the end chosen.

The child's instincts and interests are determined, the child's imagination with its relation to truth telling and deceit, the formation of right habits, the development of the child's will power, the question of obedience and of punishment, the child's play and its relation to his mental, moral, and physical development are each considered.

In connection with the study of children's literature the following topics are studied: The different classes of children's books, the

interests and values of each class, the art of story telling, a brief sketch of the history of children's books, the art of leading the child from a certain interest in reading to a related line of reading, the tests of a wholesome and helpful book for children of varying ages.

HOME NURSING AND EMERGENCIES

NO home training is complete without attention being given to the care of invalids and dependent members of the family in the home. This involves a knowledge of simple maladies that may be treated at home and of the use of simple household remedies, the care of the sick room, care of the patient, giving of baths, the use of antiseptics, disinfectants, and deodorants.

In emergencies the instruction includes the usual requirements in caring for cuts, burns, swoons, poisoning, and accidents of various kinds.

HOME AND SOCIAL ECONOMICS

BEGINNING with a consideration of the evolution of the house, the home, the family community, and home functions, and humanizing and civilizing effects of home functions upon the character of men and women, this consideration is followed with the definition of the term, home and social economics, and an explanation of the importance of the study of the same.

The following are some of the topics discussed:

Woman's industrial relations with the community outside the home.

Woman's industrial relations in the home.

The servant problem.

Industrial and ethical relations with society.

The spending of money.

Woman's social relations with the members of her family.

Woman's ethical and social relations to society at large.

This course aims to make a serious study of woman's clubs and organizations; their history and aims, their development of new and noble purposes, and lines of work, their successes and mistakes.

An attempt is made to determine problems in civic life which seem to be a part of the duties of women, such as: Civic cleanliness, humane treatment of children, causes and abuses of child labor, the "city beautiful," education, and civic morality.

ENGLISH

THE aim of the work in English is to secure facility in accurate oral and written expression of ideas. Such exercises in composition and expression are given as the needs of the class may make necessary.

As a part of the work, students perfect a regular organization as a society or club; its meetings are conducted in accordance with parliamentary usage, the members taking part in formal discussions, and presenting exercises in English under the various forms usual in such bodies.

Training is given in the matter of social and business correspondence.

LITERATURE

A SYSTEMATIC course in reading good literature is carried on through the two years, with the purpose of developing good habits of reading, an appreciation of good literature, a discriminating taste in the choice of reading matter, and a knowledge of literature available for lines of study of special interest to women.

DRAWING

DRAWING AND DESIGN include such principles of design, color, and sketching as are needed in carrying out the lines of work. Only work having direct application is undertaken as the purpose is practical rather than professional. (For outline of course see page 38.)

MECHANICAL DRAWING consists of a course of exercises that will enable the student to acquire a knowledge of the principles of projection and perspective with the application of these principles to working drawings. (For outline of course see page 38.)

GYMNASTICS

PHYSICAL TRAINING. Opportunity is offered to students for physical training in regular classes in the gymnasium and natatorium.

OUTLINES OF COURSES

PLUMBING AND BRICKLAYING

WORK in each department is designed to meet the needs of the man who has already engaged in the trade as a workman, but who wants to strengthen and broaden his preparation through systematic instruction and training adapted to his special needs. It is also designed to meet the needs of the man who has no knowledge of the trade processes or of the principles underlying them and who wishes to take the necessary steps to become a skilled workman with capacity for leadership, in the shortest possible time.

PLUMBING

IRON PIPE: The sizes and kinds of iron pipe and their uses. The names and applications of iron pipe fittings in general use today for plumbing and gas fitting work. The names and uses of the various tools used on iron pipe work such as, pipe wrenches, tongs, taps and dies, pipe cutters and thread cutting tools, and the getting out of exercises cut to measurement from plans, both for gas and water jobs. The cutting and threading of all length nipples, also the the use of unions, right and left elbows, and couplings. Exercises in gas fitting.

PLUMBER'S FURNACE: The use and handling of a plumber's gasoline furnace.

SOIL PIPE: Soil pipe and fittings and their use. The running of horizontal and vertical lines of soil pipes, the joints being packed with oakum and run with molten lead. Calking the joint, and the proper chisels to use. Testing soil pipes and best methods of finding leaks—the air, water, and smoke tests.

WIPING CLOTHS: Best material to use, method of making and preparing for use.

SOLDER: How to make good solder, how to keep in good condition and how to purify when necessary. Soldering irons, their use and care. Fluxes. Soldering cup, overcast, sweat and blind joints, and running seams.

JOINT WIPING: Wiping horizontal round joints from five-eighths of an inch to two inches. Wiping upright round joints, horizontal branch joints, and upright branch joints of these same sizes. Wiping lead and brass joints from a half to two inches. Wiping floor and wall flanges, oblique joints, horizontal and vertical Y joints, and four inch joints.

FINISHING: When the student has reached the proper proficiency he is given the advanced work of installing and connecting all fixtures used in general plumbing with their supply of hot and cold water, the appli-

cation of hot water circulation; the waste pipe, trap and ventilation of same, through the construction of plumbing for residence or building complete.

ARITHMETIC: Work will be given on the arithmetical operations necessary for the plumber in all lines of his trade. Exercises will be given for the purpose of developing facility in the application of these operations in the practical work of the trade.

MECHANICAL DRAWING: The work in this field covers the necessary elementary work, involving the proper use of instruments, correct drawing of lines, and lettering, as preparatory to the practical work of reading and making plans and elevations of plumbing.

Exercises will be given in installing work for which many of these plans have been made by students.

BRICKLAYING

MORTAR: A study of the different kinds of mortar, the mixing of mortars, the uses of each kind, and the strength of each. Lime and cement mortar. Buttered lime mortar;—colored red, black, or brown;—gauged for pressed brick. Spread lime mortar. Cement mortar.

BRICK: Kinds,—how made,—quality,—uses of each kind. The laying of brick in American, English, and Flemish bond. The application of bonding in veneered walls, cornices, party walls to fronts, face brick to back part of wall, terra cotta to wall.

ARCHES:
Kinds:—segmental, semi-circular, gothic, elliptical, jack or flat, inverted, bull's eye, relieving. Parts and how to lay out:—soffit, intrados, extrados, span, rise. Bond. Skewback. Strength of different arches.

FOUNDATIONS:
Footings:--a. spread, b. on sloping ground, c. stepped up, d. proportioning. The building of cluster piles with brick arches. The building of inverted arches with piers.

AREA WALLS, PIERS, PAVING:
Porch piers. Columns. Bonding with stone. Kinds and modes of bonding piers. Paving:—sidewalks, streets, gutters, yards, floors.

ORNAMENTAL BRICK WORK:
Cornices,—a. terra-cotta, b. corbeling. Belt courses. Black header designs. Other designs for various uses. The setting of quoins. The building of pilasters and fireplaces. Pressed brick laying, a. veneered work, b. fronts, c. inside ornamental work.

CHIMNEYS:
Flues, a. size, b. pargetting, c. withes, d. how to start.
Foundations, height and size.
Tops,—kinds: a. ornamental, b. plain.

MISCELLANEOUS WORK:

Cesspools, vaults, silos, bay windows, octagonal stack, buttresses, sewers.

ARITHMETIC:

Mensuration. Percentage and trade discount. Ratio and proportion. Square root. Formulas. Business forms and accounting.

MECHANICAL DRAWING:

Exercises to teach use of instruments, a. geometrical figures, b. projection and development. Plates of bond, a. American, b. English, c. Flemish. Plates of arches, a. segmental, b. semicircular, c. gothic, d. elliptical, e. jack, f. inverted, d. bull's eye. Quoins, cornices, and chimneys. Plans and elevations.

ESTIMATING:

How to list off materials. Cost of materials. Estimating according to plans and specifications.

ENTRANCE STOUT GYMNASIUM

STUDENTS AT WORK IN MOULDING ROOM

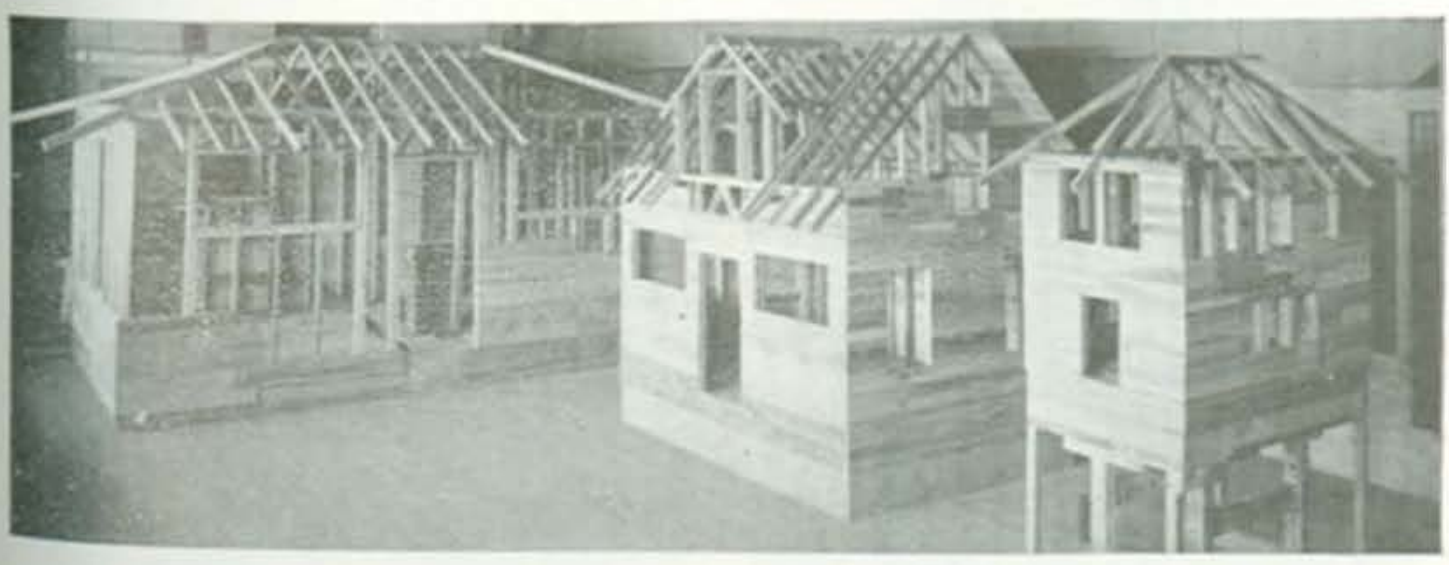
PRACTICAL APPLICATIONS OF SCHOOL ARTS

WITH ILLUSTRATIONS OF THE WORK OF STUDENTS IN THE DEPARTMENTS OF MANUAL TRAINING AND DOMESTIC ECONOMY AT STOUT INSTITUTE

WHILE the emphasis at Stout Institute is placed upon a definite sequence of tool exercises and an orderly arrangement of all work so as to cover the essentials of each line of work undertaken, a part of the time of each course is given to the application of the ideas and processes to more or less important needs as they appear.

Students in each department give a part of their time to making new pieces of equipment, and are brought to realize the necessity for careful planning and persistent attention in order that the effort shall be worth a place in the school. The value of the exercises becomes evident through the application.

Cooperation between shops and departments is shown in part by each doing such work as it can for the others. Tools needed in the plumbing or bricklaying schools are made in the blacksmith shop. Cement piers and brickwork bases needed in various shops are handled by the students taking bricklaying and cement work. Iron pipe for platform supports, steam fittings for glue heating, water connections for the dormitories, and much other practical work is installed by the students of the plumbing school. Furniture for the dormitories and for the high school is made in the cabinet making shops. Vises for different shops are started in the pattern making shop, carried through the foundry, and finished in the machine shop. Equipment of various kinds is made in the pattern and foundry shops. Students in drafting furnish blueprints for such work as is needed. Domestic science students furnish meals upon various occasions. Students in interior decoration refinish and refurnish different rooms about the school.



CARPENTRY PROBLEMS IN MANUAL TRAINING

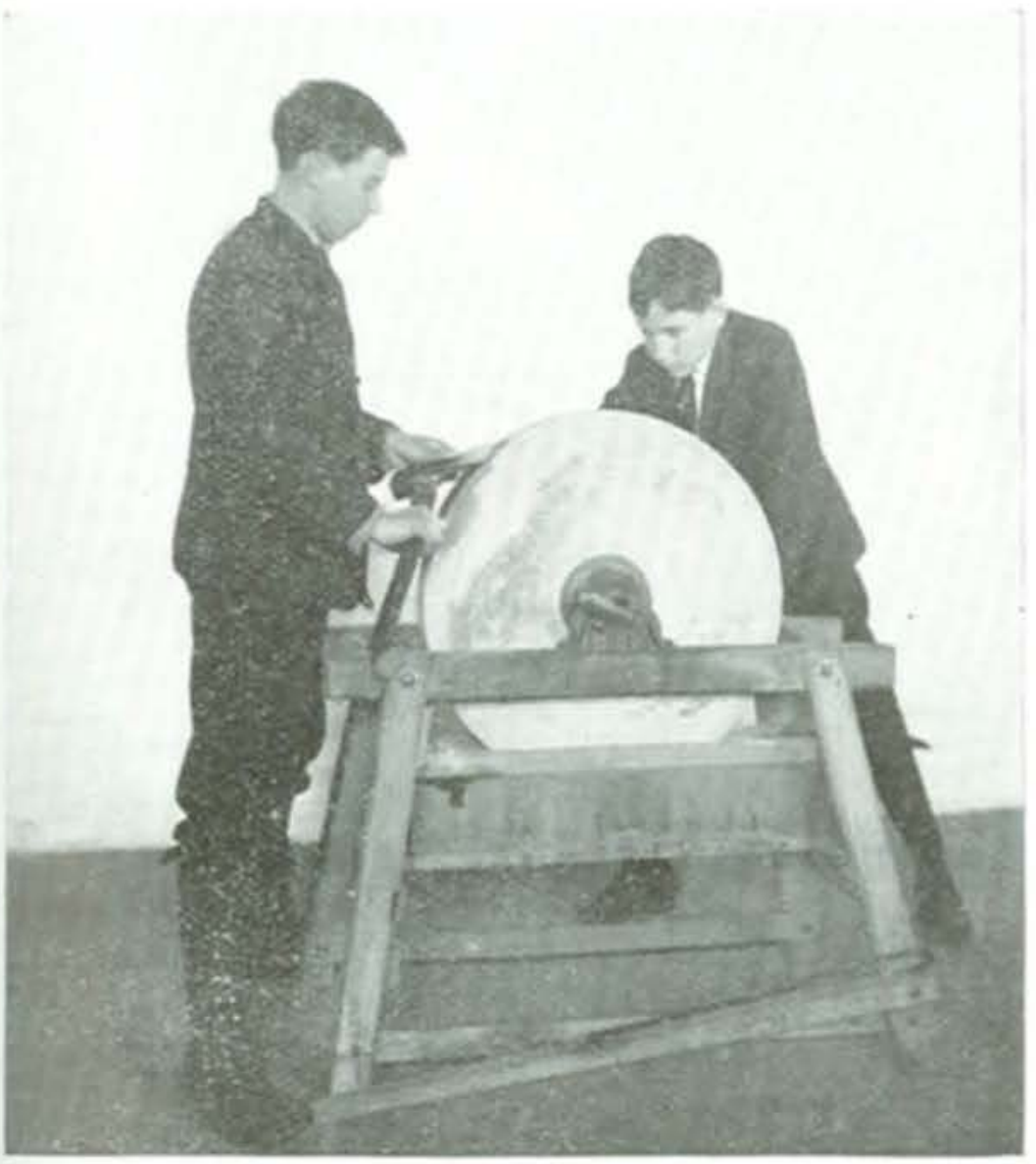
One of the practical applications of the manual training work is that undertaken in the course in carpentry given during the present school year in the sixth grade of the Menomonie public schools under the direction of the manual training department of Stout Institute. It is believed that the regular bench work usually offered in this grade has failed to some extent to connect with life out of school. In Menomonie, where most of the houses are built of wood, it seemed well to take up a few of the more essential processes involved in carpentry, as the effort necessary for successful work is within the range of the average boy of this grade. Three houses are shown as they appeared the first of March. The smallest is three feet by five feet, the second, six by eight, and the largest, about eight by fifteen. The smallest is a two story braced frame with no inside partitions. The middle house is a half sized two story balloon frame, with staircase and closet on the first floor. The largest is a three room bungalow, five eighths size, with full head room, with a chimney and fireplace put up by the bricklaying class, and with plumbing fixtures for the kitchen and bath to be installed by the plumbing class. It is expected that before the end of the year, the large house will be shingled and clapboarded, upper floors laid, two of the rooms sheathed, and one of them plastered.

SETTING A WINDOW

Home repairing is perhaps the most directly useful subject taught in the grade shops. Boys in the seventh grade have been given exercises during the past year in the making of small repairs, such as are constantly needed in the home. Each boy has set a small window, repaired a broken chair or other piece of furniture, refinished a chair, fitted a key to a door or

REFINISHING A CHAIR

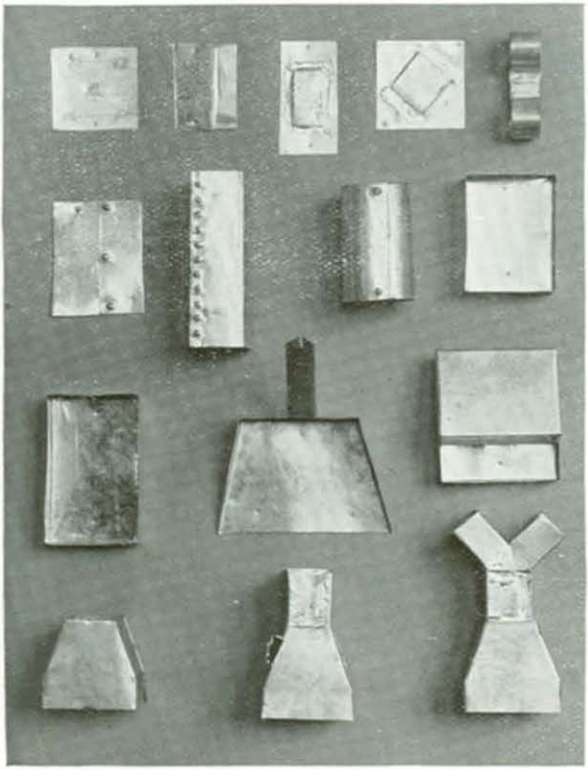
FILING A KEY



SHARPENING AN AXE

drawer lock, sometimes repairing small parts of the lock, sharpened an axe or knife or a pair of shears or skates, cemented a dish or glued a broken article, polished a piece of metal, and soldered a tin dish. In most cases, the boys brought articles from home for the repair class. Following the repair work, the boys were given a series of exercises in tinsmithing, including: the bending of a square corner, laying out and cutting to line, riveting straight joint, soldering holes, soldering straight joint, making soldered square tin box, riveting and soldering cylindrical tube, cutting and bending curves, and making funnel, making tin dust pan with handle, making box with cover, making and joining of two square tubes at a 45° angle. Where most of the grade work in manual training has been with wood, the introduction of another material has seemed desirable. The use of tin has seemed important enough to warrant its use

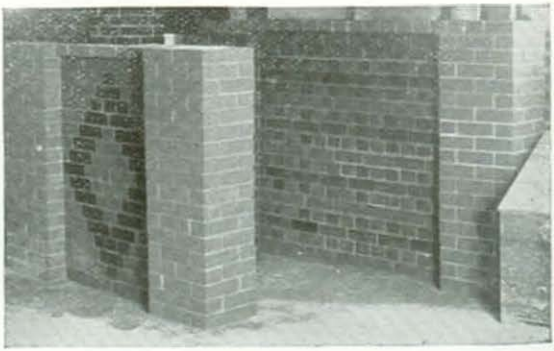
SOLDERING A JOINT



EXERCISES IN TINSMITHING

in grade classes along with wood work. The boys in the seventh grade have enjoyed the work this year, and it is believed have profited by the different manipulation required.

The boys in the eighth grade and a part of those in the last two years of the high school were given either bricklaying or plumbing during the year. While the regular work in plumbing included a study of iron pipe and fittings, the running of soil pipe with vertical and horizontal joints, and a series of soldering exercises, a part of the time has been given to applications of this work to the installation of fixtures, and other work of practical use. A complete installation of school kitchen and chemical laboratory fixtures made up an important part of this year's practical plumbing. This includes the setting up of individual gas stoves, sinks with necessary connections, an instantaneous hot

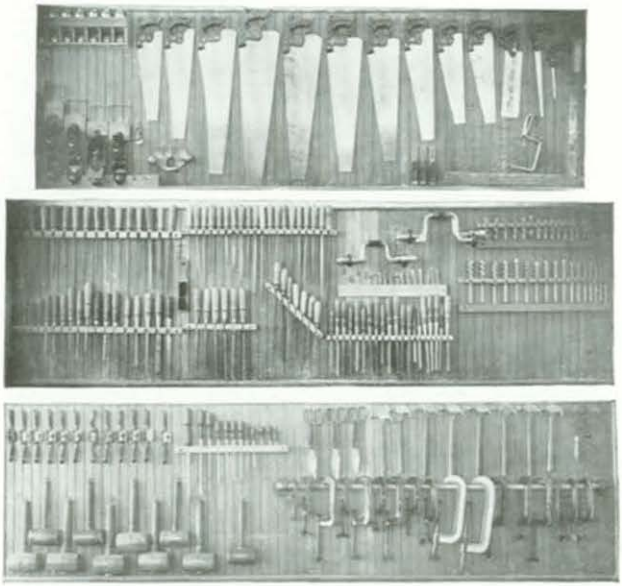


VARIETIES OF BRICK WALL

TYPICAL FIXTURES INSTALLED AT THE PLUMBING SCHOOL

water heater for the kitchen, and several lead lined sinks for the laboratory. These fixtures have been in constant use during the school year. A complete steam heating plant was put into one of the dormitories last summer by plumbing students. A good deal of structural and rail work has been done with iron piping. Boys taking bricklaying have put up chimneys and built fireplaces and have done considerable work with cement, besides the regular work of the course, which has included:—a study of systems of bonding, the building of walls and arches of brick and of concrete, the building of a brick chimney, and the laying of paving for a sidewalk.

A FIREPLACE PROBLEM

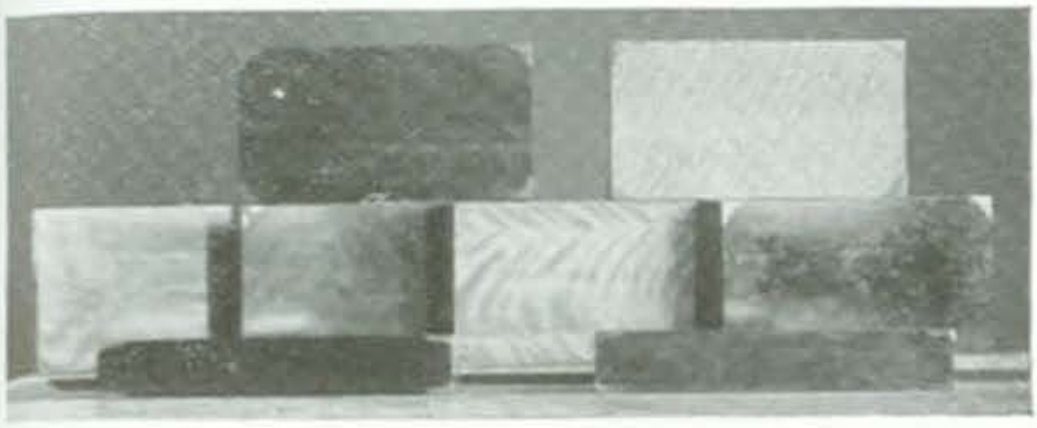


TOOL PANELS IN ELEMENTARY WOODWORKING ROOM

As a practical feature of the elementary woodwork course, a part of the time each year is taken up with the building of cabinets and tool racks and such other pieces of equipment as will make for the more convenient handling of classes. The illustrations show tool panels made for general tools used in the woodworking classes.

PROBLEMS IN FURNITURE MAKING

The application of joinery to cabinet making has included the making of pieces of furniture for special rooms or for special purposes each year. This year each junior in the training school after finishing the joinery course, made himself an inlaid checker board and a case for drawing instruments. A few years ago students in the training school united with those in the high school to make furniture for a small cottage, and furnished the cottage throughout. The furniture from this cottage is now used in two of the school dormitories. It is proving its serviceableness by daily use. This year the high school students



CASES FOR DRAWING INSTRUMENTS

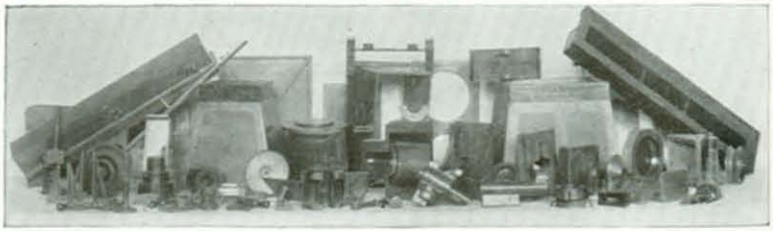
TRAINING STUDENTS' FURNITURE IN USE AT TAINTER HALL

are making several pieces of platform furniture for the assembly room of the high school. Most of the furniture is made for the student's own use, but at frequent intervals pieces are planned for the use of the school.

Pattern making and foundry work serve as a constant source of supply for parts of new equipment and for repairs upon old equipment. The illus-

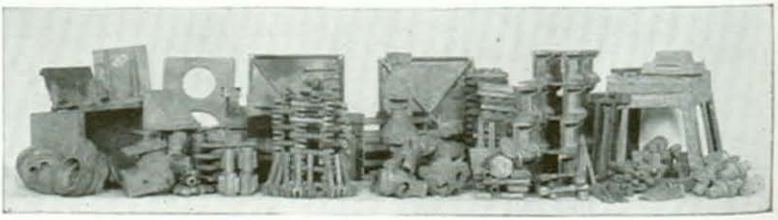
HIGH SCHOOL STUDENTS' FURNITURE AT TAINTER ANNEX

trations show some of the details of a wood turning lathe, a small machinist's vise, two styles of woodworking vises, glue heater, anvil base, swage block

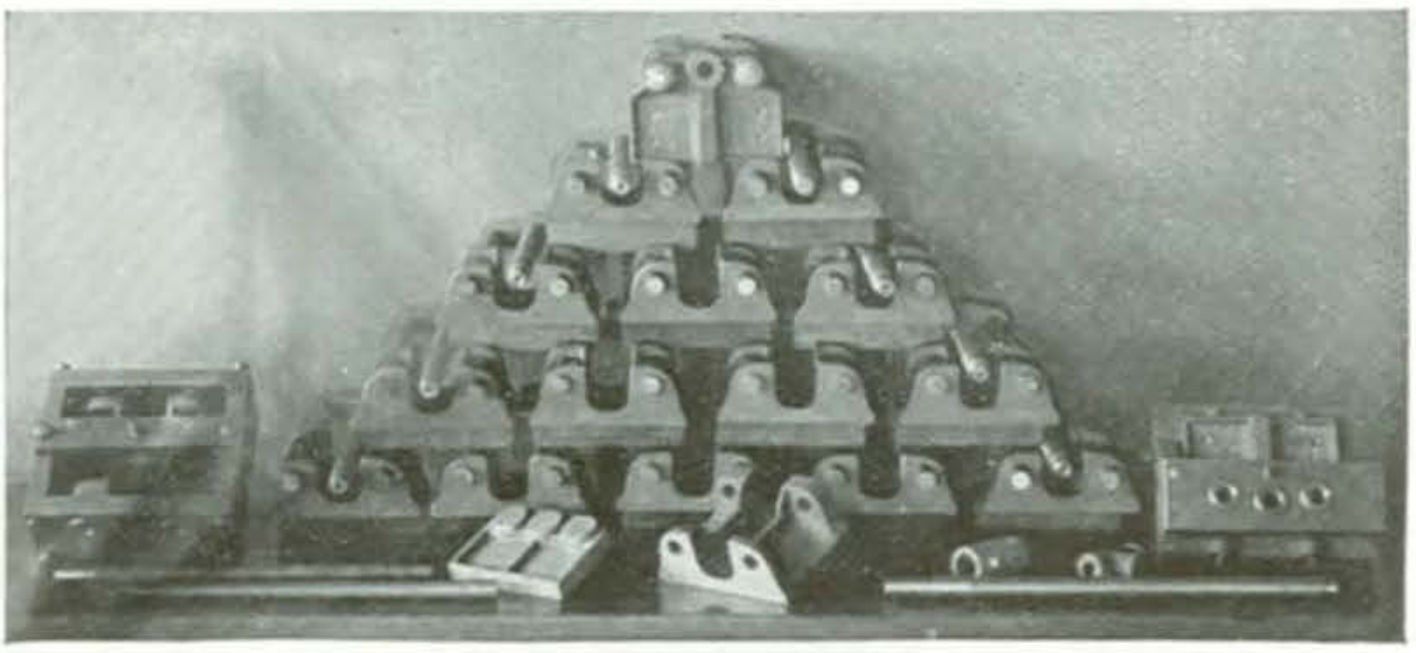


A VARIETY OF PATTERNS

base, surface plates, pulleys, hammered metal stakes, and special jigs, besides parts of the regular course of exercises.



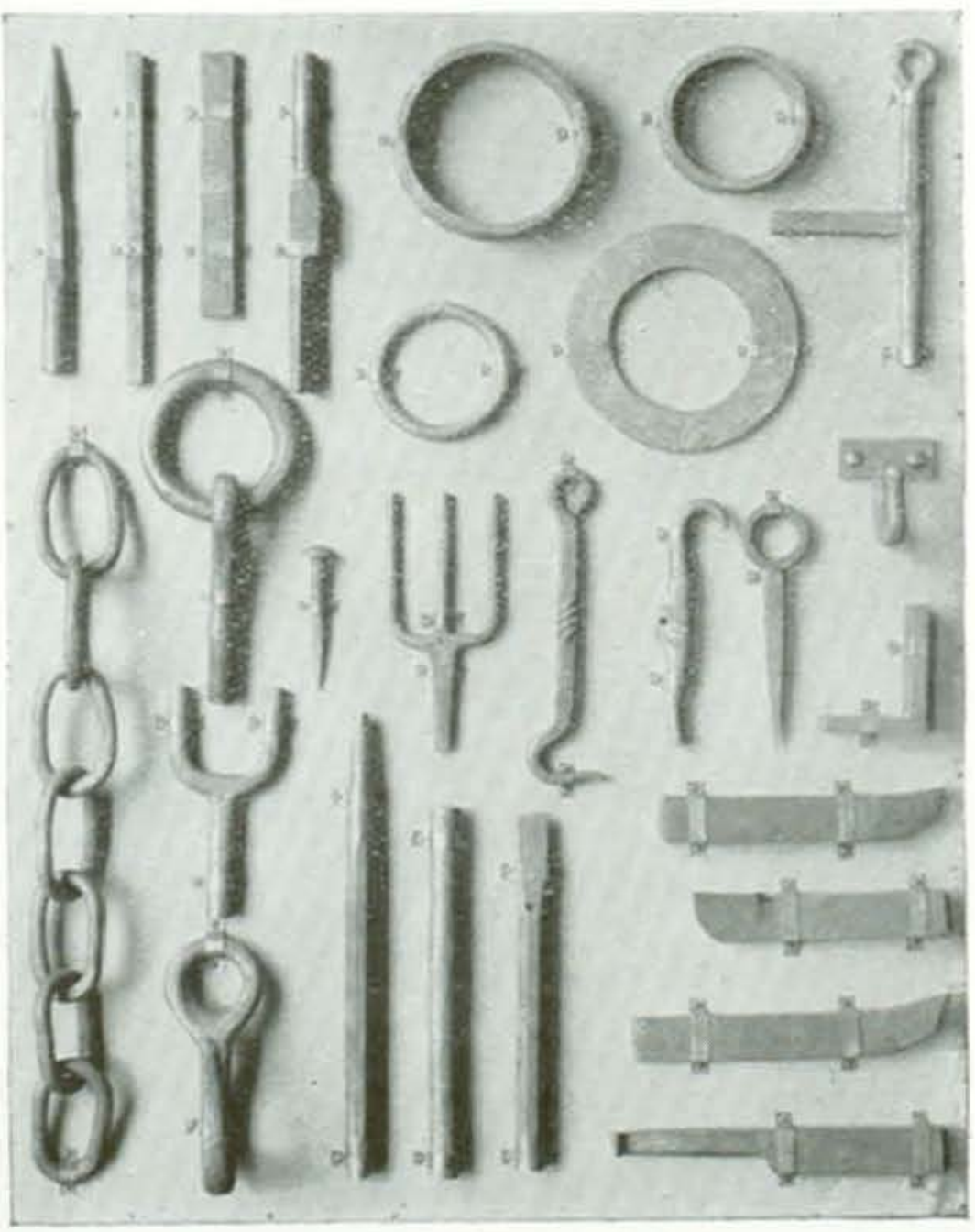
A GROUP OF CASTINGS



MACHINED PARTS OF WOODWORKING VISES WITH JIGS

Boys in the last two years of high school are given an opportunity to elect machine shop work for two successive years, and after going through the making of a series of exercises, are put to work upon larger or more difficult work involving the operations covered in the exercises. A feature of this year's work has been the making of vises for the woodworking shops.

Tools and structural work are constantly being made in the forge shop for use in many places. As soon as a student has shown ability in the mastery of the simpler processes he is given a more difficult piece of toolsmithing or general blacksmithing or allowed to take up a decorative problem.

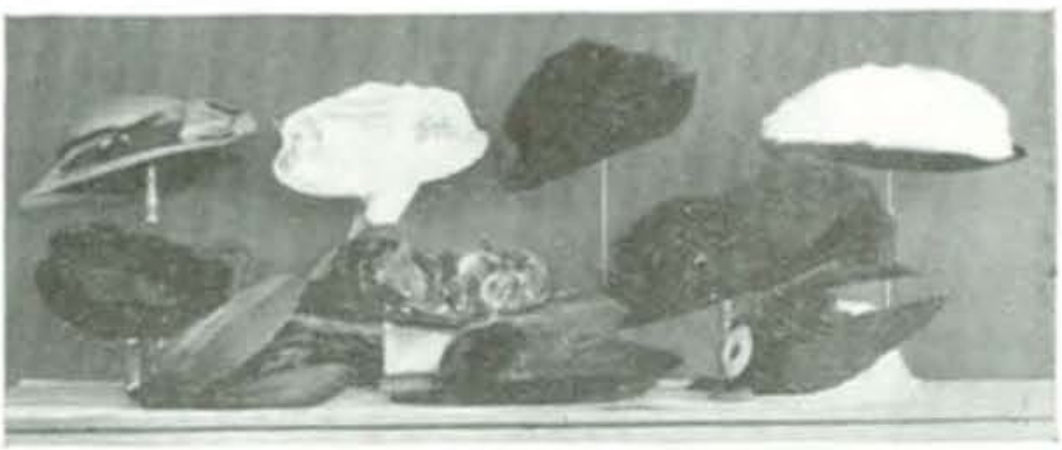


REGULAR EXERCISES IN FORGING

Students in the cooking classes are given a number of opportunities for putting into practice the results of their dietetics and food study in a variety of ways. Besides the regular class exercises in cooking, several small luncheons are served each year, and many dinners are prepared for from ten to fifteen people, particular attention being

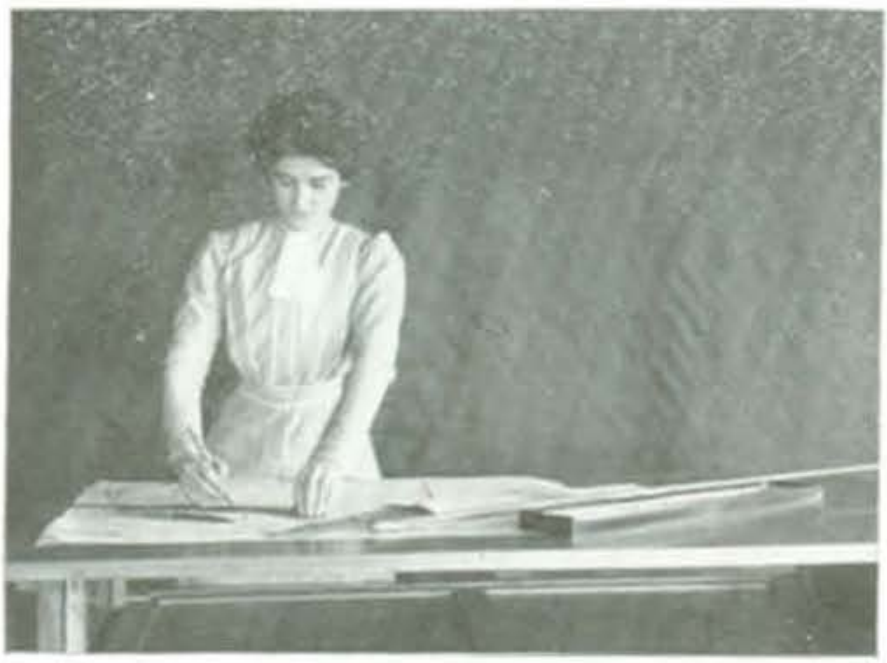
given to securing a balanced ration without losing sight of the necessity for making the meal appetizing and serving it attractively. A larger sort of application of the subject, necessitating considerable organizing and calculating, and furnishing such experience as many will need later in life, is the serving of four or five banquets each year to large groups of people. Conventions and club meetings are frequently held in Menomonie, and students are assigned to these problems as a part of the work of their courses. From one to two hundred people are usually seated at these banquets. The food is prepared, tables decorated, and meals served by the students. A definite sum of money is allowed for each plate, and this limit must not be exceeded, but must provide for everything needed.

The immediate use of the domestic art work appears in the making of clothing by the students for their own use.



PRACTICAL PROBLEMS IN MILLINERY

The class in millinery make the designs for their own hats, build up the frames, and put on the trimming, making the hat complete. Many students are able to make the hats they wear during the entire year, and at a small fraction of the cost if purchased at the millinery stores. The class in plain sewing make their own undergarments. The class in dressmaking make their own shirtwaists and skirts from measurements, drafting their own patterns, and making their dresses from the beginning. Morning and afternoon dresses, and wool or silk waists are also made by the students. The senior class students make their own graduation dresses. The classes in embroidery and art needle work carry out decorative designs for use in different pieces of clothing. and make up the clothing for their own use in such a way as to emphasize the beauty of the decoration.



DRAFTING A PATTERN

PATTERN FOR SKIRT AND FINISHED SKIRT

Students taking the course in interior decoration and furnishing, design and work out couch covers and hangings, portieres and window drapes, and find some practical problem each year, furnishing one or more rooms complete, including the choosing of the color scheme, the stenciling of such patterns as will be carried out, the selection of all the furnishings to be purchased, and finishing the rooms ready for occupancy.

"DOMESTIC ART STUDENTS STENCILING WALL OF COTTAGE

EXPLANATION OF PRACTICAL WORK

IT is not to be understood from what has been said regarding the activity of students in making apparatus for the school that the school is taking advantage of the students to have work done which should be otherwise provided for. Only such work is given to students as they are capable of doing and as will be of profit to them in doing, and furnish an example of the practical value of the regular courses. Many of the adjustments of equipment are of necessity attended to by practical workmen, and yet the faculty are constantly watching for valuable problems suited to the ability of students.

It is the aim of Stout Institute to combine a large amount of regular progressive exercises with a reasonable amount of applications to useful problems, to insure on the one hand a proper understanding of the scope of the subject with a fair degree of skill in handling it, and on the other hand an ability to make some practical use of the information and skill so acquired.

CALENDAR FOR 1910-1911

1910

June 10---Seventh Regular Session ends.

August 1---Fifth Summer Session begins.

September 2---Summer Session ends.

September 12---Eighth Regular Session begins.

1911

January 27---First Semester ends.

January 30---Second Semester begins.

June 9---Eighth Regular Session ends.

December 17, 1910--January 1, 1911---Holiday vacation.

March 25, 1911--April 2, 1911---Spring vacation.